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June 1958

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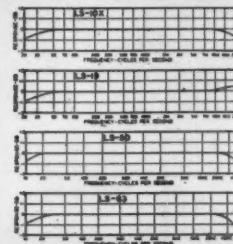
TYPICAL UNITS

LINEAR STANDARD series

Linear Standard units represent the acme from the standpoint of uniform frequency response, low wave form distortion, thorough shielding and dependability. LS units have a guaranteed response within 1 db. from 30 to 20,000 cycles.

Hum balanced coil structures and multiple alloy shielding, where required, provide extremely low inductive pickup.

These are the finest high fidelity transformers in the world. 85 stock types from milliwatts to kilowatts.



LS-10X Shielded Input
Multiple line (50, 200, 250, 500/600, etc.)
to 50,000 ohms... multiple shielded.

LS-19 Plate to Two Grids
Primary 15,000 ohms.
Secondary 95,000 ohms C.T.

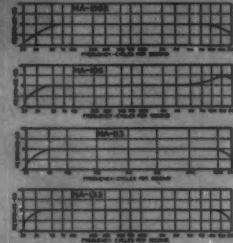
LS-50 Plate to Line
15,000 ohms to multiple line... +15 db.
level.

LS-63 P.F. Plates to Voice Coil
Primary 10,000 C.T. and 6,000 C.T. suited
to Williamson, MLF, ul-linear circuits.
Secondary 1.2, 2.5, 5, 7.5, 10, 15, 20,
30 ohms. 20 watts.

CASE	LS-1	LS-2	LS-3
Length	3 1/8"	4 7/16"	5 13/16"
Width	2 1/8"	3 1/8"	5"
Height	3 1/4"	4 3/16"	4 11/16"
Unit Wt.	3 lbs.	7.5 lbs.	15 lbs.

HIPERMALLOY series

This series provides virtually all the characteristics of the Linear Standard group in a more compact and lighter structure. The frequency response is within 1 db. from 30 to 20,000 cycles. Hipermalloy nickel iron cores and hum balanced core structures provide minimum distortion and low hum pickup. Input transformers, maximum level +10db. Circular terminal layout and top and bottom mounting.



MA-100X Shielded Input
Multiple line to 60,000 ohm grid... tri-
alley shielding for low hum pickup.

MA-100 Plate to Two Grids
15,000 ohms to 135,000 ohms in two sec-
tions... +12 db. level.

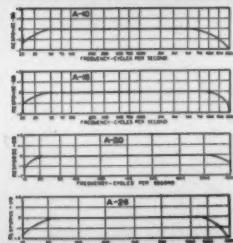
MA-113 Plate to Line
15,000 ohms to multiple line... +12 db.
level... 0 DC in primary.

MA-103 Plate (SC) to Line
15,000 ohms to multiple line... +15 db.
level... 8 Ma. DC in primary.



ULTRA COMPACT series

UTC Ultra Compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. The frequency response is within 2 db. from 30 to 20,000 cycles. Hum balanced coil structure plus high conductivity die cast case provides good inductive shielding. Maximum operating level is +7db. Top and bottom mounting as well as circular terminal layout are used in this series as well as the ones described above.



A-10 Line to Grid
Multiple line to 50,000 ohm grid.

A-18 Plate to Two Grids
15,000 ohms to 80,000 ohms, primary and
secondary both split.

A-50 Mixing Transformer
Multiple line to multiple line for mixing
mixes, lines, etc.

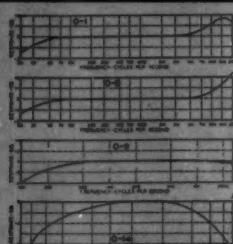
A-55 P.F. Plates to Line
30,000 ohms plate to plate, to multiple
line.



A CASE	Length	Width	Height	Unit Weight
Length	2 1/8"	3 1/8"	3 1/4"	1/2 lbs.
Width	2 1/8"	3 1/8"	3 1/4"	1/2 lbs.
Height	2 1/8"	3 1/8"	3 1/4"	1/2 lbs.

DUNCER series

UTC Duncer units are ideal for portable, concealed service, and similar applications. These units are extremely compact... fully impregnated and sealed in a drawn housing. Most items provide frequency response within 1 db. from 30 to 20,000 cycles. Maximum operating level 0 db. These units are also available in our stock P series which provide plug-in base. The D-1B is a new line to grid transformer using two heavy gauge hipermalloy shields for high hum shielding.



D-1 Line to Grid
Primary 50, 200/250, 500/600 ohms to
50,000 ohm grid.

D-4 Plate to Two Grids
15,000 ohms to 95,000 ohms C.T.

D-6 Plate (SC) to Line
Primary 15,000 ohms, Secondary 50,
200/250, 500/600.

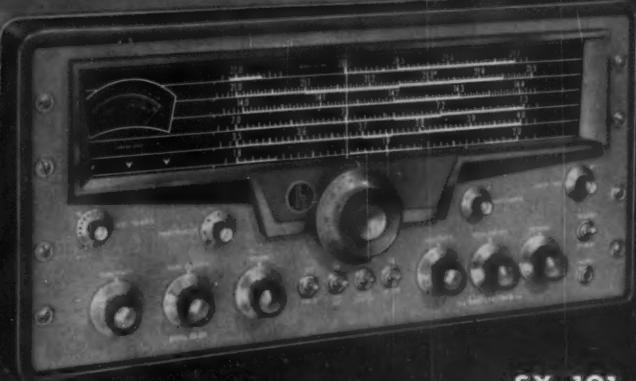
D-10 50: 1 Line to Grid
Primary 200 ohms, Secondary .5 megohm
for mike or line to grid.



DUNCER CASE	Diameter	Height	Unit Weight
Diameter	2 1/8"	3 1/8"	1 oz.
Height	2 1/8"	3 1/8"	1 oz.
Unit Weight	1 oz.		

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Why Collins SSB signals STAY CLEAN

One of the reasons why single sideband is becoming so popular on the amateur bands is the narrow bandwidth required. It was thought at one time that the generation of a single sideband signal was a difficult technical job. Even though SSB might be difficult it is worth the effort because it reduces QRM. Actually, it is easier and simpler than the generation of an amplitude modulation signal.

The SSB signal can be generated in either of two ways — the filter method or the phasing method. In the phasing method, the sideband balance is dependent upon phase and amplitude control in both the audio and r-f circuits. If this control is exact and can be maintained over the operating life of the equipment, then a clean SSB signal is available for amplification. If phase or amplitude variations exist because of temperature, humidity or aging, then the SSB signal becomes less clean and the undesired sideband begins to appear.

Now look at the balanced modulator and filter circuit used by Collins. This circuit makes a clean SSB signal and it stays that way. These are the reasons the previous statement is true. The balanced modulator generates a double sideband signal and suppresses the carrier by 30 db over a long period of time. The Mechanical Filter,

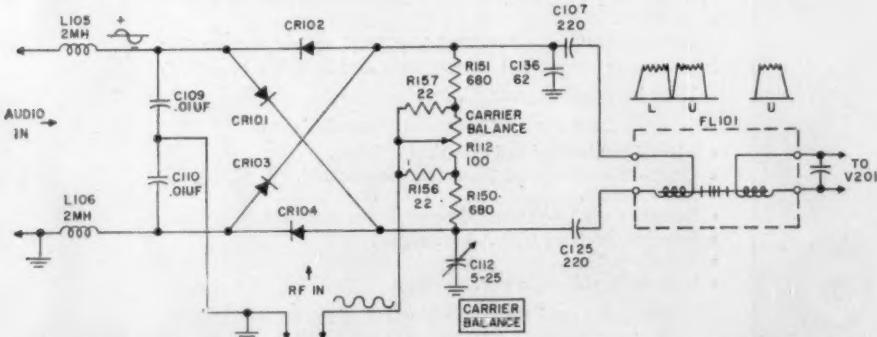
being 3 kc wide, passes only the desired sideband and attenuates the undesired sideband by 50 db. Also, at the carrier frequency, 20 db added attenuation of the carrier means that the carrier is balanced to a low level at the factory and it stays there. Temperature, humidity and aging do not affect the hermetically-sealed Mechanical Filter. It is composed of highly accurate metal discs which stay on frequency and insure a constant passband.

With the Mechanical Filter in a sideband separation circuit, the operator is assured a good voice frequency circuit without audio filters. The passband of the Mechanical Filter automatically attenuates those audio components below 300 cps and above 3 kc.

The filter method of generating a single sideband signal is economical to use and it is the best method of SSB generation. Why not join the ranks of satisfied Collins-equipped hams using these advanced techniques?

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E. W. Pappenfus
Director, "A" Division Engineering
Collins Radio Company



Collins CREATIVE LEADER IN COMMUNICATION

COLLINS



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Modern Eimac ceramic tubes offer the equipment designer many important extras. Among them is the ability to withstand impact without impairing electrical characteristics. The photograph dramatically shows what happens to a 250 watt glass envelope tube and an Eimac 300 watt ceramic tube when both are dropped from a height of seven feet. The ceramic tube "took it".

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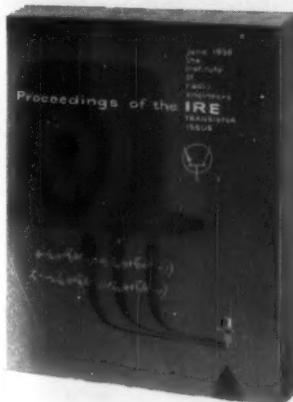
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Section Communications Managers of the ARRL Communications Department

Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each month (for preceding month) direct to the SCM, the administrative ARRL official elected by members in each Section. Radio club reports are also desired by SCMs for inclusion in *QST*. **ARRL Field Organization station appointments** are available in the areas shown to qualified League members. These include ORS, OES, OPS, OO and OBS. SCMs also desire applications for SEC, EC, RM and PAM where vacancies exist. *All amateurs in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).*

¹Official appointed to act temporarily in the absence of a regular official.

THE DECADE OF THE TRANSISTOR



IRE commemorates the tenth anniversary of a major breakthrough in solid state electronics by devoting the entire June issue of PROCEEDINGS OF THE IRE to an up-to-date summary of progress and advances in transistors. So small that many can be held in the palm of one hand, these tiny components have ended our 50 year dependence on vacuum tubes. Without transistors, our intricate guidance and communication systems for missiles would be incredibly big and heavy. With them, whole new technologies are being developed, not only for defense but for industry and commerce as well.

June Issue of Proceedings of the IRE is the New Standard Reference Work on Transistors

Only once before has PROCEEDINGS devoted an entire issue to transistors. That was in November, 1952. Despite a substantial overprinting, every copy was sold within 3 months. This classic issue, coming at a time when there were no books and few papers on the subject, is still considered one of the basic references on the subject...a suitable companion to the definitive Solid-State Electronic issue of December, 1955 and the Ferrites issue of October, 1956.

Now, to mark the tenth anniversary of the transistor, PROCEEDINGS presents the latest advances in theory and application in the June, 1958 issue. Here you will find introductory articles by its inventors—Shockley, Bardeen and Brattain—specially invited papers reviewing progress in all facets of the subject, contributed papers reporting the latest and more important advances in the field. Be sure to order your copy, today!

Partial Contents:

- "The Technological Impact of Transistors," by J. A. Morton & W. J. Pielenpol, Bell Labs.
- "The Status of Transistor Research in Compound Semiconductors," by D. A. Jenny, RCA.
- "Survey of Other Semiconductor Devices," by S. J. Angelio, Westinghouse.
- "Electrons, Holes and Traps," by W. Shockley, Shockley Semiconductor Lab.
- "Recombination in Semiconductors," by G. Bemski, Bell Labs.
- "Noise in Junction Transistors," by A. van der Ziel, University of Minnesota.
- "Formation of Junction Structures by Solid State Diffusion," by F. M. Smits, Bell Labs.
- "Germanium and Silicon Rectifiers," by H. Henkels, Westinghouse.
- "The Potential of Semiconductor Diodes in High-Frequency Communications," by A. Uhlig, Bell Labs.
- "Advances in the Understanding of the P-N Junction Triode," by R. L. Pritchard, Texas Instruments.
- "Power Transistors," by M. A. Clark, Pacific Semiconductors.
- "Application of Transistors in Computers," by R. A. Henle & J. L. Walsh, IBM.
- "Application of Transistors in Communication Equipment," by D. D. Holmes, RCA.
- "Characteristics Data on Silicon and Germanium," by E. Conwell, Sylvania.

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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

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"It Seems to Us..."



WORLD ALLOCATIONS PROPOSAL

For some eighteen months past, Government-industry groups have been meeting in Washington to formulate the official views of the United States toward the international telecommunications conference to be held in Geneva, Switzerland, in 1959. This procedure is somewhat different than that followed in some other countries, where only the governments dictate official views; in the U.S., representatives of the various non-Government radio services also participate in official deliberations, and of course ARRL has been present to speak for the amateur service in such meetings.

This preparatory work has proceeded apace in the general fields of operating regulations, technical requirements, and the like, but little progress has been made in the field of frequency allocation while waiting an announcement of the views of agencies of the Government as a basis for discussion. Thus the preparatory work took a big step forward in mid-April when the Federal Communications Commission and the Interdepartment Radio Advisory Committee jointly issued their proposals for a new frequency spectrum allocations.

Especially in view of some of the rumors which have been going through amateur ranks in recent months concerning our future, it is a matter of particular pleasure to report that the FCC-IRAC proposals include provision for continuance of *every present amateur frequency assignment* (with certain changes in u.h.f. bands to be detailed in a moment), including availability of the Loran band and the 27-Mc. ISM band!

At the moment this proposal is not yet the official U. S. position; it must be considered and approved by the Government-industry frequency committees. However, it is expected to be at least the basis of the final U. S. position and more than likely adopted substantially — if not precisely — as proposed. Inasmuch as the proposal is to continue amateur privileges as at present (with the u.h.f. modifications), we feel it is a significant victory for the amateur service; the Commission and the Government services have been confronted with exceedingly difficult problems by the demands of the other services, and the decision to hold the line on amateur bands — rather than take the easy solution by cutting into them — has only increased those problems. We can imagine no finer testimonial to their views of our worth.

The changes in the amateur u.h.f. (actually,

above 220 Mc.) bands are already in effect domestically. They result from national defense considerations — of sufficient urgency that, in compliance with a request from the Office of Defense Mobilization, FCC has put them into effect immediately. The growth of radar and associated techniques of radio-navigation and radiolocation, particularly with the coming of the "space age," has required the expansion of available space for those facilities. Several radio services other than amateur have had their u.h.f. assignments withdrawn or shifted to provide for such expansion — without notice or hearing. In the case of amateur bands above 220 Mc., the Government feels that radiolocation and amateurs can share with little or no mutual interference (under Executive powers, such military use of our u.h.f. bands has been made for years with practically no difficulty). The problem, however, is that with the exclusive amateur assignments existing in the past, an amateur has had the legal right to interfere with a radiolocation operation despite its national-defense nature. This possibility the Government can no longer face, in the national interest. The action the Commission has now taken, therefore, officially admits Government radiolocation to amateur bands above 220 Mc. (except the 21,000 Mc. band), with positioning afforded priority in the event of interference by amateurs.

We can tell you that the expectation of all concerned is that there will be little — if any — practical effect on amateur u.h.f. operation. There may be isolated cases where an individual amateur may be found to interfere with Government radiolocation work. In such event the amateur may be required to shift frequency within the band or take some other steps as necessary to alleviate the interference. In some areas, as in the immediate vicinity of missile installations, certain restrictions may be applied to amateur use of a u.h.f. band, such as the one we have had for many years on 220 Mc. use in the vicinity of White Sands, New Mexico. It is expected, however, that such instances will occur rarely, if ever.

The text of the new rules governing our above-220 Mc. operation is published in "Happenings" this month.

So much for details. In the broad picture we of course have the world conference hurdle still ahead of us, next year. But we do appear to be headed for that conference with the United States once again backing amateurs to the hilt.

Hamfest Calendar

(See page 48)

A.R.R.L. PACIFIC DIVISION CONVENTION

Fresno, Calif. — June 7-8

The Fresno Amateur Radio Club will be host to the ARRL Pacific Division Convention in Fresno on June 7 and 8. Registration fee is \$7.75, which includes the banquet. Pre-registration should be postmarked no later than midnight June 2, and mailed to Radio Amateur Convention, P. O. Box 783, Fresno, Calif.

Harry Engwicht, W6HC, Pacific Division Director, and George Hart, W1NJM, National Emergency Coordinator, will be honored guests at the banquet. There will be open-forum discussions, commercial displays, entertainment, and a Wouff-Hong initiation put on by the Trowel Radio Club. Special technical sessions will be held by groups including s.s.b., RTTY, v.h.f., novice, and traffic. Some of these groups will also hold informal breakfast get-togethers. There will be a ladies' luncheon, and possibly an organized tour to a point of interest near Fresno. Outside activities will include mobile-judging and hidden-transmitter hunts on 75, 10, 6, and 2 meters. The Hotel Californian has been chosen as the official headquarters, with 125 rooms reserved for the Convention. The hotel has a large free parking lot, which should please the mobile gang.

OUR COVER

When you receive this issue, Field Day will be just about a month away, and by this time *your* club must have been bitten by the Field Day fever, too. Our gang has been busy making plans for equipment, watch standers, and chow. We've looked over last year's scores (October, 1957, *QST*, p. 60) to refresh our memory on who did what. Our gasoline generator has been checked. Stocks of wrist linament and throat lubricant have been obtained. We're ready!

But, we won't have a Field Day location like the unusual one pictured on the cover of this month's *QST*. Our cover this month shows the Society of Amateur Radio Operators, Inc., of Oakland, Calif. (W6AEX/6), getting set up for the 1957 go. Left to right on top of the Southern Pacific caboose are W6FZC, W6CBX, and W6UHM, while W6ASJ and W6PBX tug at the hand brake (making sure the operation is portable, not mobile), and K6GDO stands (on one foot yet!) looking up at the mast.

COMING A.R.R.L. CONVENTIONS

June 7-8 — Pacific Division, Fresno
June 14-15 — Rocky Mountain Division, Santa Fe, New Mexico
July 18-20 — Alaska Territory Convention, Anchorage
July 26-27 — West Gulf Division, Oklahoma City, Oklahoma
August 15-17 — ARRL National Convention, Washington, D. C.
September 20-21 — Dakota Division, Sioux Falls, S. D.
October 4-5 — Midwest Division, Des Moines, Iowa
October 10-12 — Southwestern Division, San Diego, Calif.
October 18 — Ontario Province, Hamilton, Ontario

A.R.R.L. ROCKY MOUNTAIN DIVISION CONVENTION

Santa Fe, New Mexico — June 14-15, 1958

The Santa Fe Amateur Radio Club will be host for the Rocky Mountain Division Convention, June 14-15 — the first ARRL convention to be held in the state of New Mexico in many years.

At convention headquarters, the Desert Inn, you will pick up your program, tickets, information, and be directed to your room reservations. Saturday morning activities will feature a welcoming address, introduction of guests, and a technical address, followed by special interest luncheons for v.h.f., DX, Novice, ladies, s.s.b., etc. The afternoon activities will consist of an ARRL meeting, activities for the ladies, and a mobile hunt and judging contest. The banquet starts at 6:30 p.m., followed by awards, a dance, and finally the Wouff Hong ceremonies at midnight. Sunday morning there will be another mobile hunt and judging contest, followed by a general assembly featuring technical talks and more "eyeball QSOs."

Hotel rates in the Santa Fe area range from \$5.00 single to \$12.00 double and up. Babysitting service will be available for children two years of age and older. Advance registration (by June 1) is \$7.50; thereafter, \$8.50. The pre-convention party is \$2.50; special interest luncheons are \$1.75. Registrations should be sent to: Ruric D. Mason, W5FHL, 1838 Otowi Drive, Santa Fe.

Strays

K9IJJ claims that he has been having some very fine QSOs using double sideband and injected carrier.

KN3BIO and KN3BIO both live in Sharon (Massachusetts and Pennsylvania respectively).

Let's Go Microwave

Practical Details of the San Bernardino Microwave Society 3300-Mc. Gear

BY A. D. BREDON,* W6BGK

The story of the activities of the San Bernardino Microwave Society (by W6VIX in December QST) brought in a surprising number of requests for more information on the microwave equipment pictured therein. Here W6BGK, a past president of the Society, supplies full details of the beer-can polplexer and associated equipment, described in the December QST article.

MICROWAVES — those weird and wonderful little bits of electromagnetic radiation that can be squirted through pipes, offer much to interest the experimenter. In addition, they can provide a greatly needed communication service. In working with microwaves the experimenter will also broaden his own knowledge of electronics, as basic principles are readily observed at these frequencies.

No great degree of skill or knowledge is required to make use of the frequencies involved. Furthermore, one can get on the air with a minimum of expense, if gear available on the surplus market is used. Thus the aim of this article — to attempt to interest more people in microwave communication and experimentation.

* 2256 Canterbury Ave., Pomona, Calif.

Band Limits Changed; Now 3500 to 3700 Mc.

Just before press time FCC announced a change in the band, moving it 200 Mc. higher than the range for which the polplexer described here was designed. The following changes are required for the new band:

Use two dietetic juice cans ($2\frac{1}{4}$ inches inside diameter) soldered together, with adjacent ends cut out, of course. Dimensions from the closed end of the can thus formed are as given in Fig. 2. To tune above 3550 Mc. the 726A must be modified. Grind off the strut weld and back off the 6-32 nuts one turn to stretch the cavity. Most tubes so treated will tune to 3600 Mc.

Raise the repeller voltage by inserting an OB2 in series with the OA2 regulator tube in the power supply, Fig. 1. The series resistor, R_1 , may have to be lowered in value with this change.

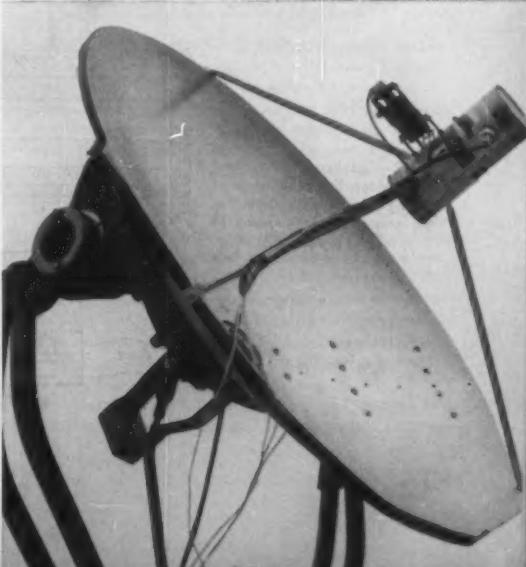
To begin with, let's set up a small microwave station. The circuits and polplexer described below have been built and used on the air with excellent results. Since 726A klystrons are available on the surplus market at a reasonable price we will choose the 3300- to 3500-megaeyeble band to start with. Almost all 726A klystrons will tune the complete band, and all should tune at least a good portion of it.

We now require a power source. This can be built from scratch, or an existing supply may be used. Good regulation is desirable and important. VR tube regulation would work, but electronic regulation is preferable for the beam supply. The circuit of Fig. 1 is suggested. Note that the positive side of the 300-volt supply is grounded; therefore, the shell of the klystron will not be at a high potential with respect to ground. If an existing supply with the negative side grounded is used, proper care must be exercised to prevent electric shock. Use a protective can over the klystron and an insulated tuning tool.

Next, we will need an i.f. strip. A 30-Mc. strip of 5 or 6 stages and a band width of around 2 Mc. will be excellent for the beginner. Many surplus radar i.f. units are ideal for this use. It is not absolutely necessary that 30 Mc. be used for the intermediate frequency, but it is a good figure because of the availability of surplus units. In any case, be sure you have a friend build one with the same i.f. or locate an amateur with a microwave setup to allow testing one another's rig.

Having obtained or built a power supply and i.f. strip we have only to build the r.f. components

The beer-can polplexer, mounted on its parabolic reflector.



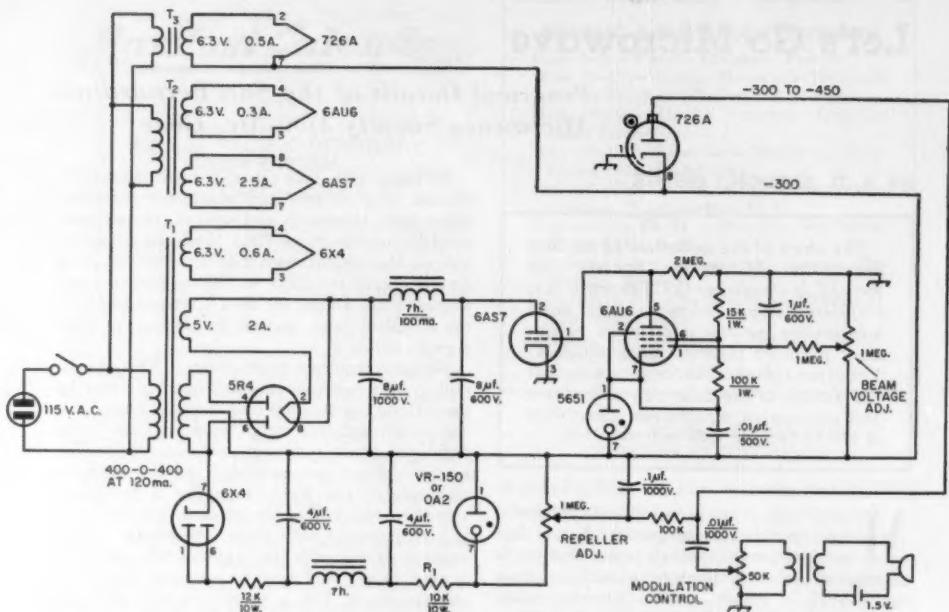


Fig. 1—Schematic diagram of the regulated power supply for use with the 3300-Mc. station. Value of R_1 should be adjusted, if necessary, to give about 15 ma. through the regulator tube. Minimum current values for the various filament transformers are given. T_1 and T_2 can be one transformer, if a suitable combination of secondaries can be found in one unit.

of the system. W6IFE of the San Bernardino Microwave Society, and others, have designed what we call the "polplexer."¹ The theory of this was suggested by Lawson and Pound.² The

¹ Lawson, *Radiation Laboratory Report 977*, January, 1946. (Cross polarization.)

² Pound, "A Duplex System of Communications for Microwaves," *Proc. IRE*, Vol. 36, p. 840, July, 1948. (Frequency difference duplexing.)

frequency-difference method was used by Merchant and Harrison³ in the first 2-way work ever done by amateurs in the microwave region, and in most amateur microwave communication since. The polplexer uses frequency-difference duplexing, adding cross polarization to isolate the

³ Merchant and Harrison, "Duplex Phone on 5300 Mc.," *QST*, January, 1946, Page 19.

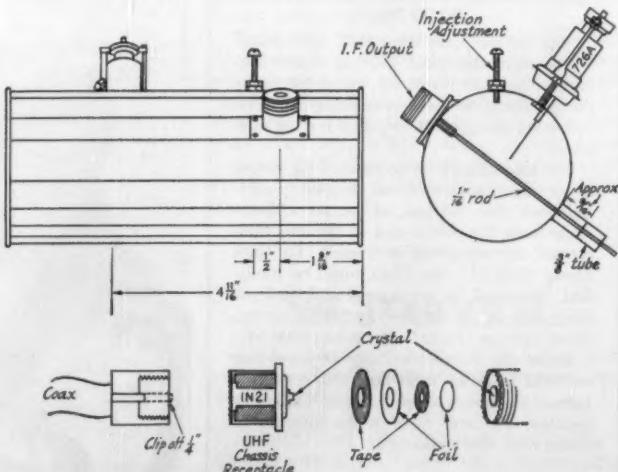


Fig. 2—Details of the beer-can polplexer. Exploded view of the by-pass capacitor built into the crystal mount is shown at the lower right.

transmitter from the receiver. Figure 2 shows the dimensions and mechanical details of a polaplexer. Many variations are possible.

To make use of this system one station tunes to a given frequency, say, 3333 Mc. The other station then tunes to this frequency plus or minus the intermediate frequency. If an i.f. of 30 Mc. is used, the second station would tune to 3363 or 3303. One klystron then serves as both transmitter and local oscillator. In order to couple sufficient energy from the klystron to the crystal to allow efficient mixing, a local oscillator injection adjustment screw is used. The l.o. injection should be adjusted to provide approximately 0.5 ma. crystal current. Figure 3 shows a typical crystal current metering circuit.

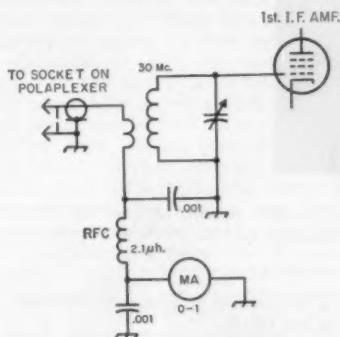


Fig. 3—Circuit for monitoring the polaplexer crystal current.

Polaplexer Details

As described by W6VIX in December *QST*, the San Bernardino Microwave Society polaplexers are made out of beer cans. The probe on the 726A tube is extended by $1\frac{1}{2}$ inches by soldering a stiff wire to the inner conductor of the probe. If the resonator shell is hot, make sure that there is no d.c. contact between the outer conductor and the can.

Perpendicular to the klystron probe we see the mixer probe. This is tuned by means of an adjustable short at the lower right of the end-view drawing. The crystal is mounted in a coaxial fitting, modified as shown in the sketch. The center element of a u.h.f. coaxial fitting is removed, and the hole left thereby is enlarged slightly to pass the body of the crystal. Connection to the small end of the crystal is made with a contact removed from an old tube socket. This is soldered to $\frac{1}{16}$ -inch diameter rod. The movable short at the opposite end of the probe is made by drilling a $\frac{1}{16}$ -inch hole in a piece of brass that is a force fit in the $\frac{3}{8}$ -inch tube. The latter should be sawed lengthwise to within $\frac{1}{4}$ inch of the can, to permit the brass shorting slug to slide inside the tube, but still maintain a fairly tight fit. Position the short at the point that gives maximum crystal current, and then solder both joints. Caution: hold the $\frac{1}{16}$ -inch rod in heavy pliers, between the crystal and the short, to drain off

excess heat and prevent damage to the crystal.

Energy at the intermediate frequency is taken off through a modified male coaxial fitting. The tip of this fitting is cut off about $\frac{1}{4}$ inch, so that it just bears against the foil by-pass capacitor that is built into the fitting on the polaplexer. The capacitor is designed to bypass the energy at the injection frequency, but not that at the intermediate frequency. It is made as follows: cut two disks of Scotch electrical tape, one $\frac{7}{16}$ and one $\frac{1}{16}$ inch in diameter. Cut a hole slightly larger than the pin of the mating plug in the center of both pieces of tape. Cut a hole very slightly larger in the $\frac{1}{16}$ -inch aluminum foil. Now place the smaller aluminum disk on the crystal and center it carefully in the receptacle. Place the smaller disk of tape on this, making certain that no foil is exposed except at the center. Next, place the larger foil, followed by the larger piece of tape, on the assembly. When this is properly done, there will be no contact between the two pieces of foil. The pin of the mating plug bears on the small piece of foil. The larger foil is the grounded side of the capacitor.

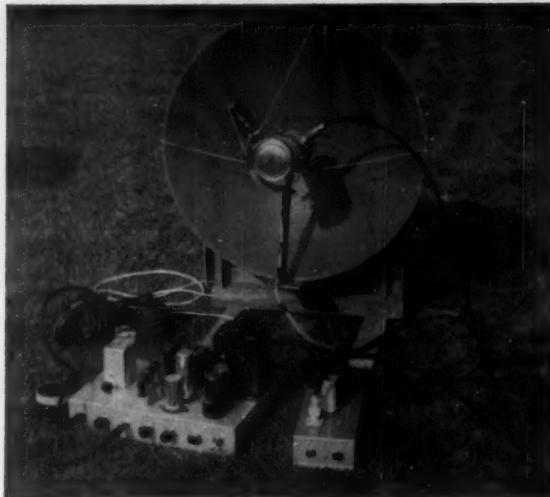
The polaplexer may be used by itself as an antenna for distances up to a few hundred feet. For longer distances a parabolic reflector should be used. The polaplexer then acts as a feed horn for the dish, as shown in the photograph. The polaplexer alone has a beam width of about 60 degrees each side of center. This is ideal for illuminating the parabolic dish. In any case, the polarization of transmission should be rotated 45 degrees to the right looking toward the other station. In this way all stations are identical. The transmitting polarization at Station A will match the receiving polarization of Station B and vice versa.

The distance record for two-way communication on 3300 Mc., 190 miles, was set by W6IFE and W6VIX of the San Bernardino Microwave Society. The equipment at each end consisted of a 48-inch parabolic reflector, polaplexer, 30-Mc. i.f. strip, and power supply similar to that described above.

The Doppler Radar Method

By substituting a fairly high-gain audio amplifier for the 30-Mc. i.f. strip, a low power Doppler radar can be made. With a reasonable-size antenna, 24-inch diameter or larger, moving objects may be detected for a few hundred feet. Whenever the antenna is pointed at a moving object an audio note will result. The frequency of the audio note will be proportional to the speed of the object toward or away from the antenna. Interesting effects may be observed when the antenna is beamed toward an electric fan, a clock, or a fluorescent light.

This Doppler method also provides a good way to adjust the antenna feed (to focus the system). The antenna should be pointed at an electric fan at the greatest distance a tone can be heard (a few hundred feet). Adjust the position of the polaplexer toward or away from the dish to the point of strongest signal. If considerable move-



3300-Mc. rig built by W6OYJ, of the San Bernardino Microwave Society.

ment of the horn is necessary to produce a noticeable change (or if the original distance to the fan is small) move the fan farther away, and repeat. This focusing is extremely important, as a great deal of power can be wasted by having too wide a beam, due to imperfect focusing.

Checking Frequency

Since it is important to know that the klystron is operating within the band, we must have a method of measuring frequency. Cavity wavemeters are preferred but are usually too costly. A good substitute is to use the reflection null method. With the klystron in the polaplexer operating, adjust the l.o. injection to give about 0.5-ma. crystal current. Place it near a vertical metal surface and find the first point *several inches away* at which the crystal current is minimum, mark exactly the position of the mouth of the polaplexer. Move the polaplexer or the reflecting plane away through several null points, counting the maximums, and again mark the position of the mouth of the polaplexer at the last good null

point. Carefully measure between the two marks. The frequency may then be found by the formula

$$f \text{ (Mc.)} = \frac{5905 \times n}{\text{distance (inches)}}$$

n is the number of *maximums* between the two marks.

This is in effect the old Lecher-wire wavemeter without wires. It was shown in use on the cover of *QST* for September, 1948, the frequency in that case being 10,000 Mc.

One of the beauties of the system as described in this article is its versatility. In order to work the other microwave bands it is necessary to change only the polaplexer. The power supply, i.f. strip and parabolic reflector may be used on any band. The only limiting factor is the trueness of the parabolic reflector surface. Most surplus reflectors (if not beat up) are good on all bands up to 10,000 Mc. It is even possible — for the very ambitious only — to make one's own parabolic dish. However, this article is devoted to the simple approach, so we will not attempt to give directions at this time.

Strays

K4LRO is less than 5 feet tall, and so figures that his call stands for Little Radio Operator.

Because of all the interest in various kinds of certificate awards, W8TZO suggests that when we order QSLs we include our *county* as part of the information on the card.

W3EVO isn't sure whether he wants call letter license plates — he already has license plate EE 73 88.

A beginner who had pretty well mastered his 45 r.p.m. code records provided himself with a "new" set at higher speeds merely by playing them at 78 r.p.m. — W8KSL

Welex, Inc., of Fort Worth, Tex., make a unit called a GEN-O-DRIVE which utilizes a stepped pulley arrangement to provide higher generator output at engine idling speeds. The GEN-O-DRIVE disengages when the engine gets above 1000 r.p.m. Their address is P. O. Box 11336.

The Versatile Standing-Wave Ratio Indicator

Become a Bridge Expert in One Easy Lesson

BY BYRON GOODMAN,* W1DX

JUDGING by some of the letters received at Headquarters and by remarks heard over the air, not everyone who owns a standing-wave indicator knows the several different jobs it can do around the shack. If there weren't a strict taboo against it, this article would have been called "Getting the Most Out of the S.W.R. Indicator." (There aren't any editorial objections to getting the most out of anything; the objections are to the overworked cliché.)

To make sure that we're all talking about the same thing, let's review a little. Back in the days before coaxial feed lines were available, very few hams worried about the "standing-wave ratios" on their open-wire lines. A few studious types knew that such things existed on transmission lines, and a very few (non-operator types probably) could even make primitive approximations of the s.w.r. if their hands were forced. These primitive measurements consisted of trotting up and down the transmission line with a suitable indicator and finding the values of maximum and minimum voltage (or current). The ratio of the maximum voltage to the minimum voltage was called the "standing-wave ratio," and the hot shots called it the "v.s.w.r.," for "voltage standing-wave ratio." The resultant number turned out to be the same as the ratio of maximum current to minimum current. It meant very little to anybody but engineers.

When WW II came along it brought, among other things, the rapid development of microwave and waveguide and solid-dielectric coaxial-line techniques. One thing you don't do on microwaves is to get yourself mixed up with high standing-wave ratios, because the losses mount up and components like magnetrons and such don't remain on their best behavior. First efforts at measuring the s.w.r. in waveguides and coaxial lines involved the old trotting-up-and-down-the-line technique (using probes and slotted lines) and, frankly, it was very slow and a pain in the notebook. The slotted line is useful for measuring some other things but if all you want is a number called the "s.w.r." then something direct reading is more desirable.

The direct-reading instrument showed up after a while, in the form of a device called the "directional coupler." The standing waves on a line are formed when all of the energy isn't absorbed at the load; some of it is reflected back and, with the later energy headed for the load, sets up the standing-wave pattern of maximum and minimum voltage (and current) points along

the line. (The mechanics of all this is explained in many books, if you care to dig into it.) The directional coupler makes it possible to measure independently the energy in a line going from the generator to the load and also that reflected from the load back toward the generator. A high s.w.r. occurs when much of the energy is reflected, a lower s.w.r. is obtained when little energy is reflected, and the s.w.r. = 1:1 when no energy is reflected.

The value of the directional coupler should be obvious. If for some reason we want to know the s.w.r. in a line, we don't have to trot up and down it (which gets to be difficult in most practical antenna installations); we can make our observations at the transmitter end of the line. With more and more solid-dielectric coaxial line in use by amateurs, the directional coupler was a real boon. First one to appear was the Micromatch,¹ followed by the Twin-Lamp² and then the Monimatch³ with its several versions. There is an allied device called the "s.w.r. bridge" that will measure the s.w.r.,⁴ but it cannot be left in the line at all times the way the other devices can. It does, however, have an excellent place in the scheme of things.⁵

Why Know the S.W.R.?

But what good are these devices? Smart hams could always tell when they had power going out the feed line; they used r.f. meters (thermocouple or hot-wire type, depending on the era) when they were in the chips, and they used flashlight

¹ Jones and Sontheimer, "The 'Micromatch,'" *QST*, April, July, 1947.

² Wright, "The 'Twin-Lamp,'" *QST*, Oct., 1947.

³ McCoy, "The Monimatch," *QST*, Oct., 1956; *QST*, Feb., 1957.

⁴ Pattison, Morris, Smith, "S.W.R. Meter for Coaxial Lines," *QST*, July, 1947.

⁵ Corderman, "A Composite Test Set," *QST*, Dec., 1955.

The s.w.r. indicator is a magical little instrument that is taken for granted nowadays, although slightly more than a decade ago you would have been burned at the stake (or at least roasted on the podium) for even suggesting that such a thing was feasible. Commonplace as it is today, however, the sad fact is that many owners don't know how to use s.w.r. information except in the most elementary ways. Read this article and you will see what we mean.

* Assistant Technical Editor, *QST*.

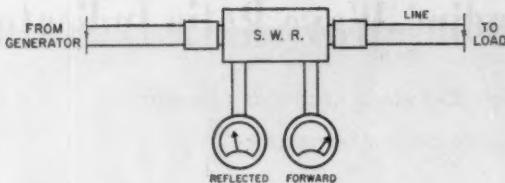


Fig. 1—Standing-wave indicators exist in several different forms and are identified by as many different names. The directional couplers discussed in this article all have three points in common. They are used in the line, they can handle the full transmitter power, and they measure the s.w.r. by comparing the Forward and Reflected powers.

bulbs or neon lamps when the groceries came first. But, you say, these modern transmitters with low-impedance output have to work into a line that has a low s.w.r. (Not necessarily so, but it's a popular misconception.) Phooey! Low-impedance output has been used for many years (ever hear of "link coupling"?), and we have been able to load transmitters, and properly, too. Suppose you have a Monimatch and a coax-fed dipole, and the indicated s.w.r. is 2.2; what do you do about it? (You tune up in the usual fashion, say you have "a fairly low s.w.r." and continue to operate, that's what you do!)

What we're driving at here is simply this: Many of the owners of s.w.r. indicators are merely using them as expensive output indicators and conversation pieces. They aren't beginning to make use of the capabilities of the instruments.

What the S.W.R. Indicator Can Do

The Micromatches and Monimatches consist of (1) an instrument that you connect in the line, (2) a two-position switch and (3) a meter. The switch points are labeled "Forward" and "Reflected," meaning that in the Forward position the meter reading is proportional to the power going toward the load, and in the Reflected position the meter reading is proportional to the power reflected (not absorbed) by the load. Whenever any reflected power is indicated it means that some of the power present is "reactive" or "apparent"; this may foul up your thinking and confuse your arithmetic if you aren't familiar with real *vs.* apparent power, or

power factor, but don't let it throw you; the reflected power isn't dissipated in your transmitter, and all it ever does is run up your line losses some.⁶

Sometimes the meters are calibrated in watts, but more often you merely use the relative readings. The meter can be calibrated to indicate the s.w.r., because the s.w.r. can be found from a comparison of the Forward and Reflected readings. A ham with two meters could dispense with the switch and use a dual indicator like that pictured in Fig. 1. Don't let those fancy titles like "generator" and "load" scare you off; these are merely to show that the power source is at the left and the thing you're delivering the power to is at the right. The "generator" is usually your transmitter but it could be a driver stage or a signal generator; the "load" is usually the antenna but it could be the input circuit of a driven amplifier or a dummy load. Any of the power-handling instruments (Micromatch, reflectometer, Monimatch) have a negligible effect on the s.w.r. in the line to the left, but this isn't necessarily true of the resistive s.w.r. bridge referred to earlier.

In this enlightened age practically everyone knows what the meter readings will be when the load has a resistance equal to the impedance of the line. (The "impedance" of the line is determined by the physical and electrical characteristics of the line; you know RG-8/U to be 52-ohm line, RG-11/U to be 75-ohm line, and so on.) If the line is RG-8/U or some other 52-ohm line and the load is 52 ohms, when we turn on

⁶ Goodman, "Losses in Feed Lines," *QST*, Dec. 1956.

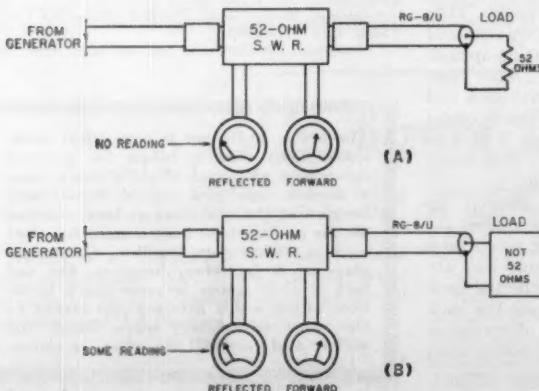


Fig. 2—(A) When the line is terminated in a load equal to the impedance of the line, the Reflected power is zero and the s.w.r. is 1:1. (B) Any other termination will result in some Reflected power.

the generator the Forward meter will show something but the Reflected one will show nothing, as in Fig. 2A. The directional coupler is labeled "52-ohm S.W.R." to remind you that if it were designed for another line-impedance value we wouldn't get the same results (the Reflected meter wouldn't read 0).

This case with the load equal to the line impedance is of course a familiar thing to anyone who has used an s.w.r. indicator. The load doesn't have to have an ohmic resistor as shown in Fig. 2A; it can be, and more often is, the radiation (plus ohmic) resistance of an antenna. A standing-wave ratio of 1:1 means that there is zero reflected power, and the losses in the line are a minimum when the reflected power is zero. The length of the line should have no effect on the s.w.r.; the s.w.r. is determined solely by the relationship between the line impedance and the load.

When the load is anything other than a resistance equal to the line impedance, some reflected power will be indicated, as represented in Fig. 2B.

Using the Directional Coupler

Getting down to cases, here are some of the ways you can use the directional coupler:

1) To indicate resonance and proper coupling in the transmitter when no antenna coupler is used.

The way many hams use the things, by tuning the output amplifier for the highest indication of Forward power without burning up the transmitter. Manufacturers of s.w.r. indicators certainly don't object to this application, but a less-expensive indicator will serve just as well.

2) In the line between transmitter and antenna coupler.

Permits adjusting the antenna coupler to give an s.w.r. of 1:1 in the line between transmitter and coupler, desirable with pi-network output and when a low-pass filter is used. The low s.w.r. also minimizes losses in this length of line, although this is usually of minor importance in what is normally a short length. Remember that

your adjustments do not affect the s.w.r. in the line between coupler and antenna. However, you can use the s.w.r. indicator in the line between coupler and transmitter to measure the s.w.r. on the line between coupler and antenna.⁷

3) To adjust coupling at input circuit of final amplifier, when amplifier is coupled to driver through coaxial line.

When this is done with driver and amplifier running at normal power, the resultant coupling condition for a midband s.w.r. of 1:1 on the short coupling line also gives the best band width, which means you don't have to retune as often when changing frequency within a band.

4) To adjust matching section between antenna and line.

One of the very useful applications. The adjustment of a gamma match is a cinch with an s.w.r. indicator, and sheer guesswork without. With the antenna resonant (formula length) merely vary the gamma until a 1:1 or very low s.w.r. is indicated. The gamma match with an adjustable capacitor is the most convenient to use. If you can climb the tower you can use the s.w.r. indicator up at the antenna; if you have a light mast or tilt-over job that won't support you, rig up a string drive to adjust the capacitor with the antenna up in the air. The length of line usually isn't very important below 30 Mc., but above 50 Mc. the s.w.r. indicator is best used no more than a few wavelengths from the antenna. When the losses in the line begin to mount up, as they will in long lines at v.h.f., you will get indications of a match at the transmitter end of the line that aren't true at the antenna end. The extent of this effect is shown in Fig. 3. We've seen a coil of cable a few hundred feet long used as a dummy load for a v.h.f. transmitter; it made very little difference in the s.w.r. if the line was terminated or not.

5) To check antenna resonance.

Another of the more useful applications. If an antenna is used as the termination for a line, the frequency of minimum (not necessarily 1:1)

⁷ Grammer, "Universal S.W.R. Measurements With a Coaxial Bridge," *QST*, Dec., 1950.

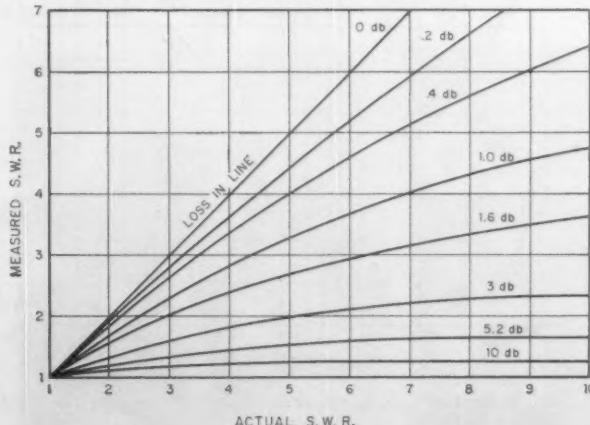


Fig. 3—Indicated s.w.r. as a function of true s.w.r. This clearly demonstrates the need for measuring the s.w.r. near the load when making matching adjustments at an antenna, if a long (lossy) line is used. (From an article by John Lory, courtesy of *Electronics* magazine, a McGraw-Hill publication.)

s.w.r. is the frequency at which the antenna is a pure resistance (no reactance), and this is the resonant frequency of the antenna. Thus to find the resonant frequency of an antenna fed directly by coaxial line, it is only necessary to vary the frequency of the transmitter until the frequency of minimum s.w.r. is found. (Don't just look for minimum Reflected power; you have to make sure that the Forward power is still there, and this will probably require a few coupling adjustments at the transmitter as you run over the band.) If the minimum s.w.r. occurs at the high-frequency end of the band and you prefer to be peaked at a lower frequency, lengthen the antenna. If the minimum s.w.r. occurs at the low-frequency end and you have your heart set on the high, make with the cutters. You might be tuning a dipole made of No. 12 wire, or one of the new XTC4U specials (the one made from 14 beer cans and a piece of wet string); you can still use the technique. Just remember to make the resonance check with no matching section between the antenna and the line⁸, and be sure you find the minimum s.w.r. and not just the minimum Reflected power with some fixed transmitter coupling.

The above is based on the fact that near resonance the radiation resistance of an antenna changes slowly. Considering it to remain constant about the resonant frequency, any reactance added to the resistance will increase the s.w.r. when this antenna is used as a load for a line.

If you have any curiosity about your antenna, you can even get a fair idea of what the antenna impedance is, just by measuring the s.w.r. at resonance and then making an educated guess.

⁸ The line should be connected in the center of a half-wave antenna or in a current loop (point of maximum current) in a long wire.

For example, suppose the s.w.r. turns out to be 1.6 at the resonant frequency, and you are using 52-ohm line. You know that the antenna impedance must be either 83.2 ohms (52×1.6) or 32.5 ohms ($52 \div 1.6$), from the relation

$$Z_0 = R_1 \text{ (s.w.r.)} = R_2 \div \text{(s.w.r.)}$$

where

$$Z_0 = \text{Line impedance}$$

$$R_1 = \text{Resistive termination smaller than } Z_0$$

$R_2 = \text{Resistive termination larger than } Z_0$
Your educated guess would probably be the 32.5 ohms, in the case of a multielement beam.

If your meter reads Forward and Reflected power, the s.w.r. can be determined by the use of Fig. 4.

Effect of Harmonics

There may be occasions when the Reflected reading will run higher than the Forward. This doesn't necessarily mean that the unit has gone haywire; in most cases it will be an indication of a serious u.h.f. or v.h.f. parasitic oscillation in the transmitter. In the case of a c.w. transmitter, the Reflected reading may jump up to a high value as the key is closed and then drop down to a more normal value; this means that there is a momentary v.h.f. or u.h.f. parasitic oscillation as the key is closed.

When you are getting down to very low readings of reflected power, you have to avoid any appreciable spurious content in the transmitter if the load you are adjusting is frequency sensitive. In other words, if you are adjusting something that tunes, like a gamma match or an antenna coupler, it will give a proper termination for the line at only one relatively narrow band of frequencies. You will tune and tune and never get the s.w.r. down to 1:1 if there are a few watts

(Continued on page 156)

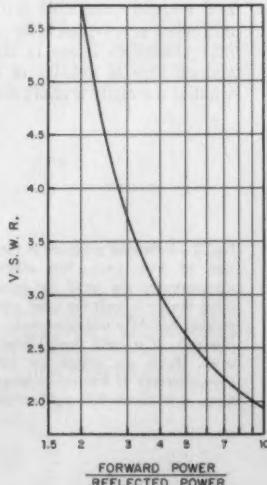
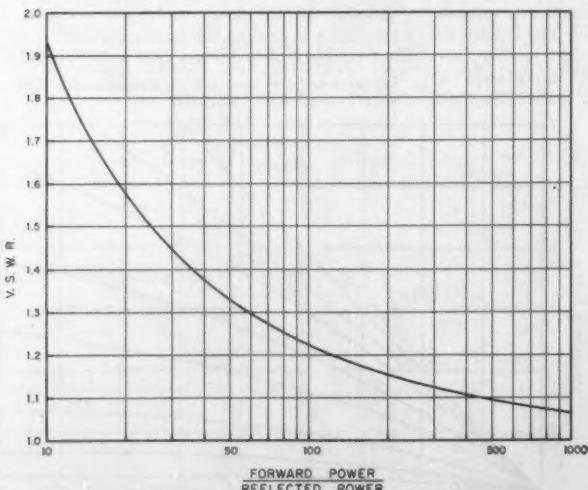


Fig. 4—Graph of s.w.r. vs. ratio of Forward to Reflected power. Use the chart on the right for low power ratios.

AS LONG AS you remain in the Novice Class your transmitter must be crystal controlled. This, of course, means that you're restricted to the frequency or frequencies for which you have crystals. The FCC wants it that way.

But you do have a reasonably wide range of choice: within the assigned frequency range of the Novice bands, you may pick any frequency that appeals to you. Having done so, the chances are that after a short time you will wish you had picked some other crystal frequency — or that you could change the frequency of the crystal you now have — because every other Novice seems to have chosen the same spot to operate. Or perhaps you've seen surplus crystals advertised at bargain prices, but unfortunately not in the Novice bands, and could give yourself quite an assortment of frequencies if only you knew how to "move" crystals to spots where you're authorized to operate.

Whatever the reason, changing the frequency of a crystal has its useful aspects, especially for the Novice. It's not hard to do, actually, but it has to be done the *right* way or you may wind up by having no crystal at all. The purpose of this article is to show how it can be done safely. First, though, a little background about crystals in general.

What Crystals Are

Crystals used for transmitter frequency control are mechanical resonators, something like a tuning fork or a bell, but with one very important difference — while the crystal is vibrating mechanically it is also generating an electrical voltage of the same frequency as the mechanical vibration. This "piezoelectric effect" is characteristic of only a few substances found in nature, the most important one for our purposes being quartz. Also, unlike the tuning fork or bell, the frequencies of vibration are far beyond audibility — running, as we know, into millions of cycles per second.

Such an oscillating crystal is actually a thin slab or plate cut from the natural quartz. In the crystals that are used for amateur-band trans-

Crystals Where You Want Them

Grinding Techniques for the Novice

BY LEWIS G. MCCOY,* W1ICP

Do you, Mr. Novice, have all the transmitting frequencies you want? And do you find that crystals you have, or can get cheaply, are on the wrong frequencies? If so, you'll be interested in knowing how to move a crystal where you want it. It's not hard, and it's an interesting pastime in itself

mitter frequency control the dimension that controls the frequency of oscillation is the thickness of the plate; the thinner it is, the higher the frequency. The plate has to be cut from the "raw" crystal in just the right way (with respect to certain "axes" of the crystal) in order to oscillate at all, and the two sides of the wafer must be flat and parallel within extremely small tolerances.

Originally, oscillating plates were cut from the raw crystal along what are known as the "X"

* Technical Assistant, CST.

A setup for grinding crystals using the waterproof abrasive paper method. Note the quick-change adapter clip for putting the holder together. This is made from a piece of metal — aluminum, tin or copper — strong enough to hold its shape. The size of the adapter will depend on the size and shape of the holder.



and "Y" axes, and these early crystals were known as "X-cut" or "Y-cut" depending on which axis was used. Both these cuts were somewhat temperature sensitive — that is, the frequency of oscillation was subject to change as the temperature of the crystal varied. Later, several other cuts less subject to frequency-temperature effects were discovered. The ones of most interest to us are the "AT" and "BT" cuts, since these are the ones commonly used for transmitter control in the medium- and high-frequency range. Of the two, the AT-cut is the more active piezoelectrically but is much thinner for the same frequency than the BT-cut. Above about 5 Mc. an AT-cut becomes so thin that its use is rather impractical because it is easily fractured, so the BT-cut is generally used for frequencies higher than this.

A crystal plate cut from the raw crystal must be "finished" by grinding it so its sides are flat and parallel and the thickness is exactly right to produce the desired frequency. In commercial crystal manufacturing, the initial work is done by machine grinding and then the crystals are brought to the final frequency by a chemical process called "etching." However, very good results can be obtained by hand grinding, especially when the problem is simply to change the frequency of an already-finished crystal.

The crystals most commonly used in amateur stations today are those designed to fit the FT-243 type holder shown in the photograph. The crystal ordinarily measures about $\frac{1}{2}'' \times \frac{5}{8}''$, with the thickness depending on the frequency. If you have access to a micrometer you'll find on measuring the crystal that the surfaces are very nearly parallel, although the thickness at the corners and edges may be slightly less than at the center — by as much as a few ten-thousandths of an inch. This thickness variation, called "contouring," is a factor in obtaining maximum activity in a crystal.

If we grind away some of the quartz and make the crystal thinner, it will oscillate on a higher frequency. With a little experience, it is possible to move a crystal several hundred kilocycles. In essence, crystal grinding consists of rubbing the crystal back and forth over a flat surface that has been covered with grinding compound. Before we discuss the actual process of crystal grinding let's see what is needed in the way of materials.

Grinding Materials

All the materials needed for the job can be purchased or ordered at your local hardware store. There are two suitable methods of home grinding, and the one you choose will determine what materials are needed.

First, with either method you'll need a perfectly flat surface for the grinding operation. A piece of plate glass about 12 inches square makes an ideal surface. One of the two methods to be discussed makes use of a grinding compound such as carborundum powder and the other utilizes waterproof abrasive paper. If you decide to use compound you'll need a few ounces of No. 220

grit and a like amount of No. 400. Grinding compound is graded by number; the lower the number the coarser the grit.

The waterproof abrasive paper is available in several different grades of grit.¹ One sheet each of Nos. 400 and 220 will be satisfactory for most grinding jobs. If you decide to use the paper you'll also need a small amount of rubber cement; this is used to attach the abrasive paper to the plate glass and affords a simple system for changing papers.

Holder Adapter

Since it is necessary to keep a continual check on the frequency of the crystal as it is being ground down to its final frequency, much time can be saved by making a "quick-change" holder adapter. This is merely a piece of metal bent in the form of a clip, as shown in the photograph. It eliminates the job of fastening the cover of the holder in place each time a crystal is checked.

The only other items needed are your receiver and transmitter.

Grinding the Crystal

Let's take a "for instance" to demonstrate how a crystal is ground. Suppose some generous ham has made you a present of a 3720-ke. "rock." Obviously, you cannot use the crystal until you move it into the Novice band. This means that the crystal frequency must be raised more than 30 kc.

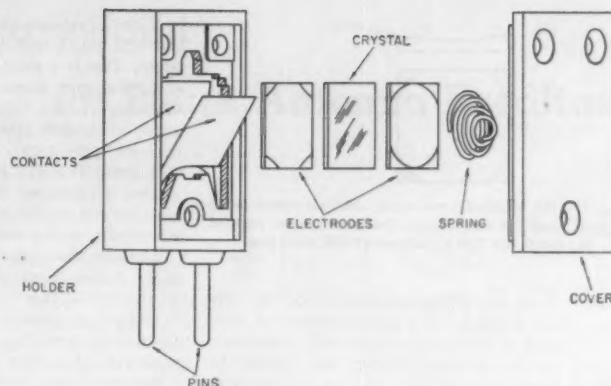
Some method of checking the crystal frequency after each grinding operation will be needed, and your receiver can be used for this purpose. Let the receiver warm up so that it is not subject to drift, and after it has settled down, plug the 3720-ke. crystal into your transmitter and turn on the oscillator. (If the transmitter is one in which the oscillator cannot operate unless the entire rig is on, use a dummy antenna. You don't want to be radiating a signal on the air when checking your crystal!) Also, you have to have some method of knowing where the edges of the Novice band are, obviously² — this is something you ought to have, anyway. We won't go into that subject in this article, but will assume that you do have some way of telling whether a signal you hear on your receiver is in or out of the Novice band.)

Tune in the signal from the oscillator and ad-

¹ Waterproof abrasive paper is made by several companies and the writer was able to obtain three different brands from a local hardware dealer. These brands were: Jewelite Waterproof Paper, Abrasive Products, Inc., South Braintree, Mass.; Wetordy Tri-M-Ite Paper, Minnesota Mining & Mfg. Co., St. Paul, Minn.; Waterproof Carborundum Paper, The Carborundum Co., Niagara Falls, N. Y.

² The best thing for this purpose is a crystal-controlled frequency standard. A simple 100-ke. crystal oscillator such as the circuit shown in the chapter on measurements in the *Handbook* can be used. Checks at 50-ke. intervals can be made with 100-ke. markers by listening to the second harmonic of the frequency being checked. For example, if the crystal in the transmitter is oscillating on 3752 kc. its second harmonic, 7504 kc., will be heard just above the 7500-ke. marker from the 100-ke. oscillator. When listening on the second harmonic, dividing the measured frequency by 2 gives the actual frequency.

Fig. 1 — The different parts that make up the crystal holder. The crystal is held in place by the electrodes and these three items are placed between the contacts in the holder. As pointed out in the text, it is important to be careful when disassembling the unit because the spring is under tension when held down by the lid.



just the receiver gain to give a moderately strong signal. Don't let the receiver be overloaded, because if you do you won't be able to tell accurately enough just where the signal is.

Set the piece of plate glass on a table or other convenient working surface. Also at the working area you'll need the No. 400 grinding compound, a container of clean water, and some facial tissues or a soft, lintless cloth.

Remove the crystal from the transmitter (be sure to turn off the oscillator plate voltage or open the key) and remove the screws holding the lid of the crystal holder. Be careful, because there is a coil spring under compression just below the lid, and the whole works is likely to pop out of your hand — with the result that you may have to hunt for holder parts on the floor. Fig. 1 shows the component parts of the crystal holder in the order in which they come apart. Remove the holder lid and spring. (In some holders there is also a fiber spacer below the spring. This, too, should be removed.) The next part of the assembly is a flat contact that connects to one of the crystal socket pins. Lift this contact and under it you'll find the two electrodes with the crystal between them. Remove these three items from the holder. Note that the electrodes have raised metal portions or "lands" on each corner on one side. When the crystal is mounted in the holder it is clamped by these lands, leaving a small air space between the crystal and the major part of the electrode surfaces.

You are now ready to start grinding. The crystal is quite brittle and won't stand rough treatment, so handle it carefully. Put a pencil mark on one surface of the crystal and do all your grinding on the *other* side; this makes sure that at least one surface of the crystal will stay flat and "on-axis" and will serve as a reference if anything goes wrong during the grinding. Put a few pinches of No. 400 carborundum compound on the glass surface and add enough water to make a mixture the consistency of thick cream. Spread the mixture over an area about eight inches square. Lay the unmarked side of the crystal on the glass and place the tips of the index

and middle fingers on opposite corners of the crystal. Use just enough pressure to move the crystal across the grinding compound in a "figure-8" pattern. Make about five "8s," and then switch your finger tips to the other two corners and make five more. This should be enough grinding for the first pass.

Wash the crystal and wipe it dry, being careful to remove all traces of grinding compound. Check to make sure the pencil mark is still clear so you know which side is being ground. Place the crystal between the holder electrodes, making sure the raised lands are touching the corners. Put the electrodes and crystal back in the holder between the contacts and place the spring and cover in place. Use the quick-change adapter to hold the unit together. (Actually, all this can be done much more quickly than it takes to tell about it.)

Put the crystal in the rig and turn on the oscillator. You'll probably find that you have only moved the frequency enough to cause a noticeable change in the beat note from the receiver. However, take heart; you have actually changed the crystal frequency! You now know the process, and you can go through the steps again, this time making more figure "8s" to change the frequency a greater amount at one time. Keep track of the number of "8s" so you will know how many it takes to move a given number of kilocycles. This is important if you're shooting for an exact frequency, since you will want to slow down the grinding process as you approach the frequency you want. There's no replacing ground-off quartz once you've overshot the mark!

Only the fine grinding compound was used in this example. For moving a relatively small number of kilocycles — say, up to 50 or so — it is better to use the fine compound and take it in easy stages. The coarser grade should be used only when you have to take off quite a bit of quartz to get near the frequency you want. Even then, you should shift to the fine grade when you get within 20 or 30 ke. of the desired final frequency.

Either grade will lose some of its cutting power

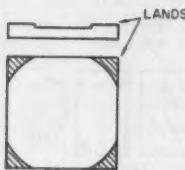


Fig. 2 — The electrodes are made with four raised areas called "lands" at each corner. The lands are the parts of the electrodes that make contact with the crystal.

after a little use. When the number of "8s" required for grinding off a given number of kilocycles tends to become excessive, add more compound to the mixture. Water, too, should be added from time to time to keep the mixture free-flowing. Also, keep rotating your "8s" as you work; this will grind the glass plate evenly and thereby prevent wearing grooves in it that will destroy its flatness.

The Abrasive Paper Method

To use the abrasive paper method mentioned earlier, you merely cement the proper grade of paper to the glass, moisten the grinding area and grind the crystal. The paper gives you uniform distribution of the abrasive. After acquiring a little experience, you'll discover that the paper method offers some advantages over the loose-compound type of grinding. When you grind over the same portion of the paper several times that area wears down and the frequency change per "figure 8" becomes smaller. You can then move to another area of the paper if you want to grind at the same speed, but still have at hand a fine-grinding area where you are able to close in slowly on your target frequency.

Keep the paper well moistened. The water keeps the crystal cool and also acts as a lubricant to prevent sticking, which could result in cracking or chipping the edges of the crystal.

As in the case of using grinding compound, the coarser paper should be used for moving the frequency rapidly through a large number of kilocycles and the finer grade for finishing off to frequency when the crystal has been brought to within 20 or 30 kc. of the final figure.

If Activity Drops

Sometimes (and this always seems to occur during the last grinding operation!) the crystal stops oscillating. If you've followed instructions so far you needn't be alarmed; lack of activity at this stage doesn't mean the crystal is ruined. Any one of several things can cause a crystal to stop oscillating. The first thing to do is to make sure the crystal and electrodes are perfectly clean. Dirt on the crystal or electrodes can lower the activity (so the crystal only oscillates weakly) or prevent it from oscillating at all.

Check to make sure that the crystal is mounted properly between the raised lands of the electrodes. It is easy to make a mistake when putting the crystal in the "sandwich."

If the crystal is clean and properly mounted but still won't oscillate, try bevel grinding the edges. This is a simple process: hold the crystal at a 45-degree angle on the grinding area and make one or two "figure 8s" on each of the four edges. If the first attempt doesn't bring the crystal back, give it two or three more trials. If this still doesn't work, it is probable that you've ground the sides out of parallel, or perhaps have a high (or excessively low) corner. A micrometer is a necessity at this point.

Measure the crystal thickness at several points to see if there is any variation. If you find a spot on the crystal that is thicker than the rest, mark it and try to grind it to the same dimensions as the rest of crystal — grinding, of course, on the same side as in your previous operations.

As mentioned earlier, the corners should be one to three ten-thousandths of an inch thinner than the center. A corner that is thicker than the main body of the crystal almost always will prevent the crystal from oscillating, so make sure that every corner is "down" just a bit as compared with the thickness at the center of the crystal.

If you've only started out to move the crystal frequency 20 or 30 kc. you shouldn't have to worry about these finer points in "contouring." Just try to keep light and *even* pressure on the crystal in making your "8s." Never put pressure on the center of the crystal during grinding; you may wind up with a concave plate that won't become active until it is reground with the aid of the micrometer.

Lowering Frequency

It is obvious that grinding a crystal always raises the frequency, since material once taken off cannot be restored. Nevertheless, it is possible to make a crystal operate at a slightly lower frequency than it normally has, by loading it mechanically so that it literally slows down. Although this hasn't any direct connection with grinding crystals, it is of some interest in case the grinding process is carried just a bit too far. However, the frequency usually can't be lowered more than a few kilocycles without a substantial loss of activity.

The method of loading generally used consists of rubbing cold soft solder on each side of the crystal. Mark a circle about one-quarter inch in diameter centered on each side and use the circles as guides when applying the solder. The solder should be applied to both sides in equal amounts, and frequent checks should be made to be sure the crystal keeps oscillating.

Another material that has been used with some success for loading crystals is India ink. The same procedure should be followed in using it.

Finally —

Not every crystal you may happen to lay your hands on can be shifted in frequency by the method described above. If the crystal has plated-on electrodes, don't try to grind it. Surplus

(Continued on page 168)

Simple Rotary Joint for Beam Antenna Feedlines

BY THOMAS F. SNYDER,* K6PGB/4

OF POSSIBLE interest to many constructors of beam antennas is a coaxial-type rotating joint made with Amphenol type C connectors. This coaxial feedline connection permits continuous rotation and will handle power equal to that permitted by the rating of RG-8/U cable. Connectors used are the types UG-570/U and UG-573A/U, otherwise identified by Amphenol catalog numbers 82-502 and 82-530, respectively. Each is a weatherproofed, 50-ohm, constant-impedance unit of bayonet-lock design.

A method of rigging the assembly to a rotary beam is shown in Fig. 1. Notice that the rotating portion of the beam mast must be accessible below the rotor mechanism, and that the lower end of this mast is equipped with a cap which supports the type UG-570/U bulkhead jack. Coaxial cable for the connection between the jack and the gamma-match — or what have you — is fed up through the rotatable mast.

The main feedline is terminated at the rotator end with a type UG-573A/U plug. The coaxial cable should be clamped to the fixed mast an inch or so below the plug. Allow reasonable alignment between the cable, the plug and the bulkhead jack.

* Cocos Beach, Fla.

Editor's Note: W1SX, a manufacturers' representative with an intimate knowledge of coaxial cable connectors, adds the following to K6PGB's useful information:

If the coupling ring on the UG-573A/U plug should fail to turn freely, as might happen after considerable weather exposure, the connectors would separate on rotation in one direction. The builder could protect against this problem by lubricating the plug coupling ring at the rear after assembling the plug to the cable. The coupling ring plays no part in the electrical circuit. Be very careful to keep oil or

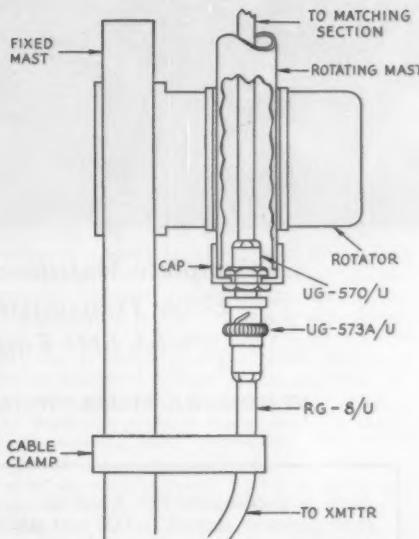
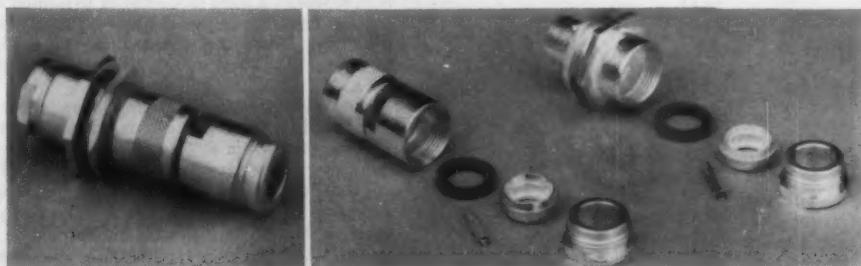


Fig. 1 — Drawing of the rotary joint made with coaxial connectors.

other lubricant out of the inside surfaces of the connector pair.

Amateurs interested in using the system described above should appreciate that type C connectors are not designed for this particular application. There is therefore no extensive experience to draw upon to indicate whether or not the connectors will stand up indefinitely.



A completely assembled set of Amphenol type C connectors is shown at the left. Individual components of the type UG-570/U bulkhead jack and the type UG-573A/U mating plug are shown in the photograph to the right.



A Complete Multiband Filter Transmitter with 6146 Final

BY GEORGE K. BIGLER,* W6TEU

Here is a complete side-band transmitter, power supply, VOX and all. Utilizing a number of surplus components, it shouldn't be too expensive to duplicate. The means for selecting the side band is novel and ingenious.

WHEN CONSTRUCTION of this exciter was started, it was hoped it would have a few features that previously described units lacked. Some of the features which appeared desirable, after several smaller rigs had been built, were:

1. Bandswitching, all-band c.w.-a.m.-s.s.b. operation
2. Side-band selection without carrier shift
3. Voice control with a loudspeaker
4. Peak limiter
5. Ample driving power for a kilowatt final
6. Good frequency calibration
7. Complete self-contained unit

All of these features are included in the exciter to be described, which has been in operation for about six months with excellent results. It is felt after this period of on-the-air tests that the unit is well worth the construction time required.

Construction and alignment should not be very difficult or time consuming for a ham with a reasonable amount of construction experience.

* 4290 Beulah Drive, La Canada, Calif.

Circuit Description

Referring to the block diagram in Fig. 1, a crystal oscillator, V_{1A} , is used to feed a cathode follower, V_{1B} , which drives the diode balanced modulator for carrier suppression. The double-side-band signal is fed through the two-section crystal filter, where the lower side band is rejected. The remaining upper side band is amplified by V_2 and fed to the mixer, V_3 . The unmodulated 450-ke. carrier signal from the cathode follower is also fed to the grid of the frequency doubler, V_{4A} , doubled to 900 ke. and fed to V_{4B} . V_{4B} is used as either a doubler to 1.8 Mc. or as a tripler to 2.7 Mc., depending on the position of the sideband selector switch. Thus the output of V_{4B} is either four or six times the crystal oscillator frequency. When the fourth harmonic from V_{4B} is mixed with the side-band signal in V_3 , the frequency sum can be taken at the output of the mixer to give an upper side-band signal at five times the crystal oscillator frequency. When the sixth harmonic is mixed with the side-band signal, the frequency difference can be taken to give the same resultant output frequency with the opposite side band.

The output of the side-band generator chassis is therefore at a fixed frequency of five times the original frequency, but with side-band selection available. This same principle can be applied to a fixed oscillator, as the b.f.o. in a receiver, for a selectable-side-band system.

The side-band signal at approximately 2.25 Mc. is fed to V_{101} , where it is mixed with the v.f.o. running from 5.25 to 6.25 Mc., to give a frequency difference output from 3.0 to 4.0 Mc.

To deliver a clean signal to the final mixer, a double tuned circuit is used, which is gang tuned with the v.f.o. The final mixer is used to convert the 3.0- to 4.0-Mc. signal to the desired band. By choosing the crystals for final conversion so that 3.0 Mc. goes to the low even megacycle end of each band, a single dial calibration from 0 to 1.0 Mc. can be used on all bands. It is only necessary to mentally add the mega-

cycles of the band in use to the dial reading to get the frequency of operation. By putting the conversion oscillator on the low side in each case, side-band reversal is eliminated. Harmonics of the 3.0- to 4.0-Mc. signal in the higher bands will fall outside the pass band where they are easily suppressed in the tuned circuits. On 10 meters, the band is divided into two sections 28.0 to 29.0 and 29.0 to 30.0 Mc.

After final conversion the signal is amplified by V_{105} and V_{106} to about 30 watts peak output. Some of the r.f. output from the final stage is fed to the peak limiter V_{201} . The d.c. voltage developed when a preset peak level is exceeded is fed back as a control voltage to V_2 , where the remote cut-off characteristic of the tube allows the gain of the stage to be modified.

V_{301} is used as a two-stage speech amplifier to feed the balanced modulator. V_{302} and V_{303} , in conjunction with a crystal diode, furnish voice control with a loudspeaker.

Construction and Alignment of Sideband Generator

The side-band generator is constructed on a $5 \times 9 \times 1\frac{1}{2}$ -inch chassis. Before construction is started the i.f. transformers can be modified as mentioned in Fig. 2. Transformer T_1 for the balanced modulator is altered as follows: Remove all the wire from the winding on the free end of the dowel. Double enough of this wire on itself to make a 25-turn jumble-wound bifilar winding $\frac{1}{4}$ inch from the remaining winding. Join the finish of one 25-turn winding to the start of the other and ground this junction to the bolt at the

top of the transformer which will pass through the hole in the can. The remaining ends are soldered to the unused trimmer terminals for tie-points. Apply coil dope and reassemble.

After construction of the unit is completed, the multipliers should be aligned first. This can best be done with an r.f. probe on a v.t.v.m.

Tune T_6 to the second harmonic of the l.f. oscillator, about 900 kc., and then tune T_7 to 2.7 Mc. with S_1 open. Close S_1 and tune the two 10-100 μ uf. trimmers (mounted on the chassis) to resonate T_7 to 1.8 Mc. The output delivered to the mixer should measure about 12 to 15 volts in both positions of S_1 . Next, insert carrier by advancing the 5000-ohm control and then peak the grid winding of T_4 , indicating resonance by measuring the r.f. at a grid of V_2 . With the r.f. probe on J_1 , tune T_5 to 2.25 Mc. Several peaks will be noted, but the correct one will be obtained when switching S_1 results in little output change and turning down the carrier control reduces the signal to nearly zero. The output should run about $1\frac{1}{2}$ to 2 volts with full carrier insertion, measured across L_{101} (Fig. 4).

Alignment of the crystal filter is next. Referring to Fig. 3, it is seen that the filter has a very sharp cut-off near the carrier frequency due to the shunt crystals Y_3 and Y_6 . Since the carrier is always on the same side of the filter, the characteristic can be shaped for better attenuation near the carrier frequency.

In selecting crystals for the filter, an adequate supply should be obtained. At a dime apiece this shouldn't break the bank and will save time in alignment. The exact channels named in Fig. 2

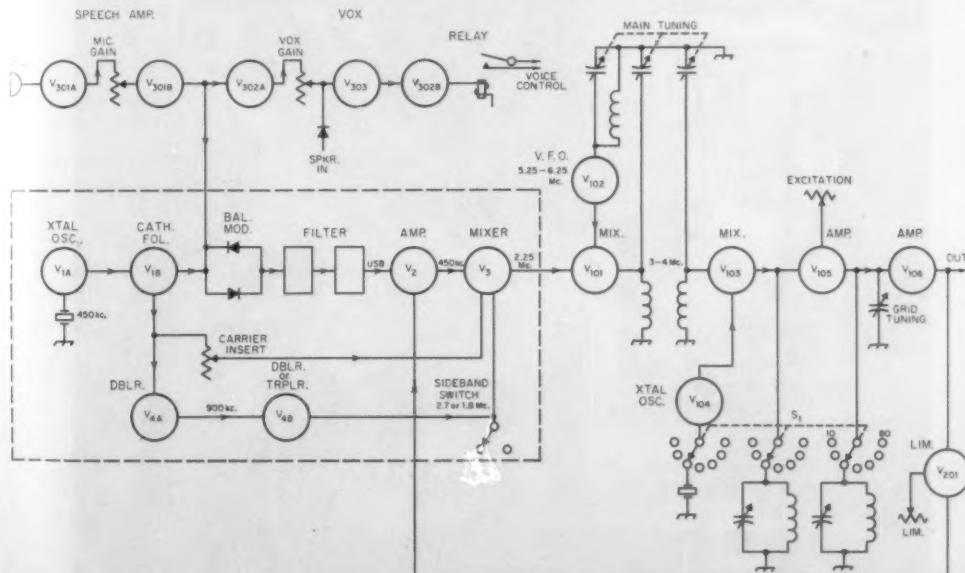


Fig. 1—Block diagram of the side-band exciter. The side-band generator proper is enclosed by dashed lines; this section of the exciter is built on a separate chassis. Side-band selection is obtained by using either the 4th or 6th harmonic of the low-frequency oscillator to convert the signal to 2.25 Mc.

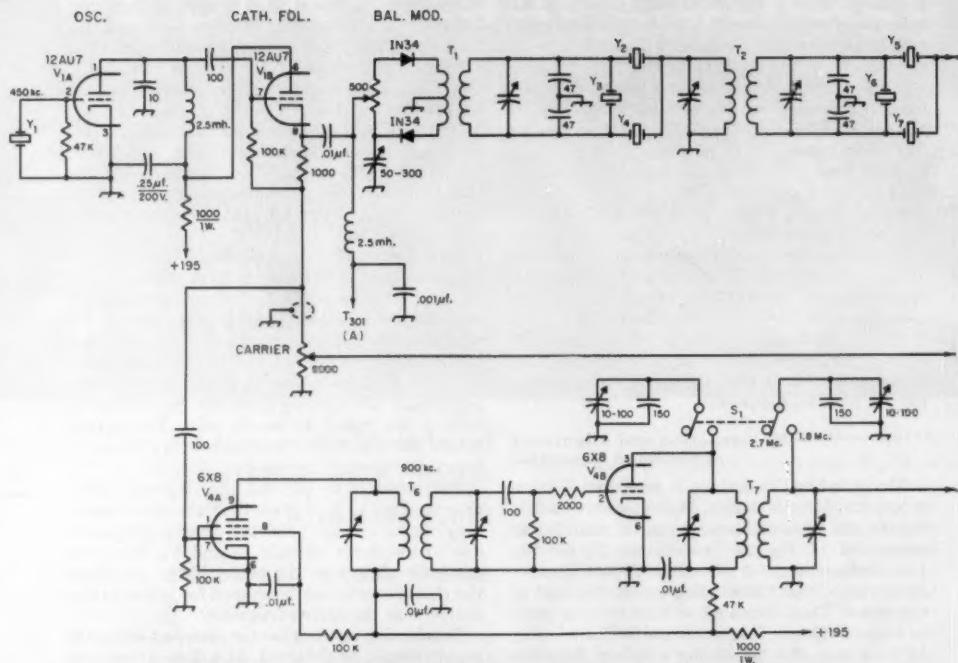
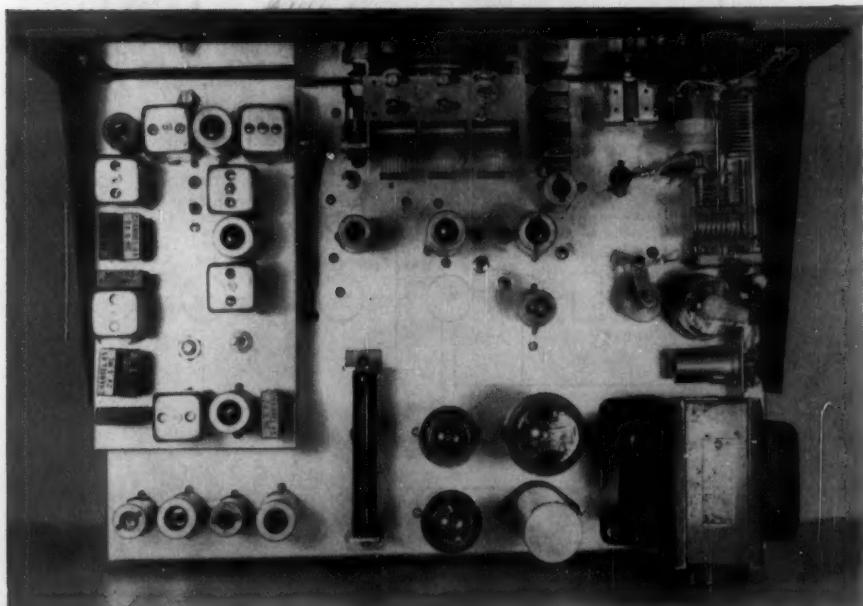


Fig. 2 (See facing page.)



Top view of the side-band transmitter. The side-band generator is mounted on a separate chassis (left) for better shielding and easy testing. Crystals to the right of the tuning gang (top center) heterodyne the signal to the output frequency. Speech and VOX at lower left.

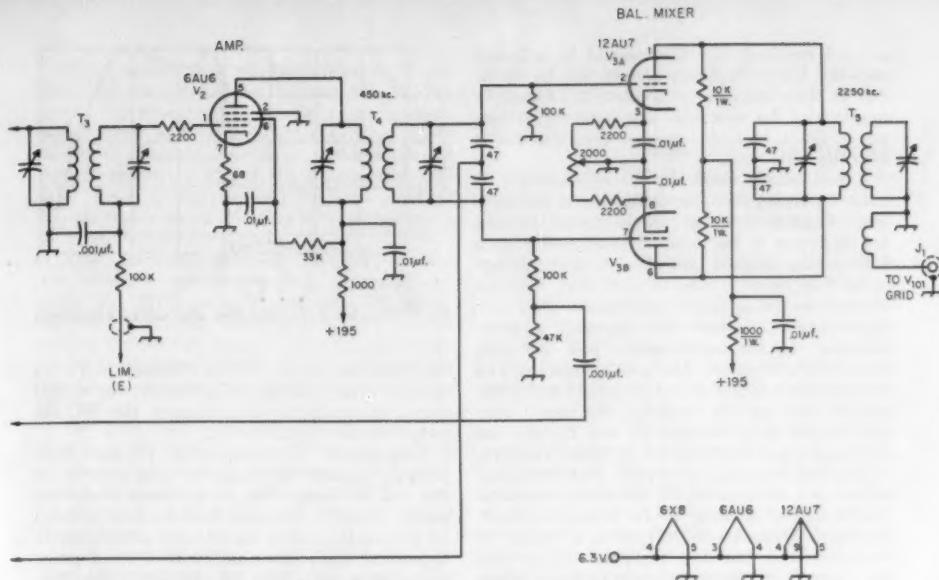


Fig. 2—Circuit diagram of the side-band generator section. Unless otherwise indicated, capacitances are in μf , resistances are in ohms, resistors are $\frac{1}{2}$ watt.

S₁—D.p.d.t. rotary switch

T₁—Modified 455-kc. i.f. transformer. See text. (Miller 112C1)

T₂, T₃, T₄—455-kc. i.f. transformer (Miller 112C1)

T₅—2.25-Mc. transformer, made by removing 8½ feet of

wire from each winding of 1500 kc. transformer (Miller 112W1) Coupling coil is 4 turns over rim of secondary coil.

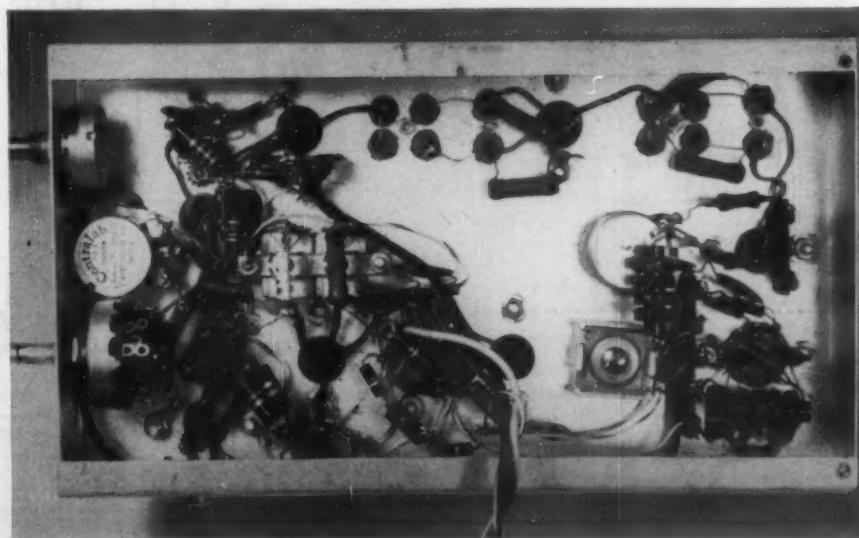
T₆—900-kc. i.f. transformer, made by removing 28 feet of

wire from each winding of 455-kc. transformer (Miller 112C1)

T₇—2.7-Mc. transformer, made by removing 9 feet of wire from each coil of 1500-kc. transformer (Miller 112W1)

Y₁, Y₂, Y₃, Y₄—453.7-kc. crystal. Surplus, marked "Channel 45, 24.5 Mc."

Y₅, Y₇—455.6-kc. crystal. Surplus, marked "Channel 46 24.6 Mc."



Bottom view of the side-band generator section. The panel controls are side-band selection switch and carrier insertion potentiometer.

are not required, but they should be adjacent and the lower frequency should not be below 440 kc. This will assure adequate 2nd-harmonic rejection of the selectable side-band signal output in the 3- to 4-Mc. channel when the dial is near the 4-Mc. end.

A preliminary check on the crystals can be made by trying them for oscillation in the oscillator. Those that oscillate can be further checked for frequency of the peaks by connecting them between the antenna post of a BC-221 frequency meter and an r.f. probe of a v.t.v.m. Pair the crystals according to the series peaks. Only two upper-channel crystals are required, and by choosing the highest-frequency pair the pass band will be broadest. The lower-channel crystal that oscillates at the lowest frequency will probably be best for the oscillator, the next higher pair for the shunt crystals Y_3 and Y_6 , and the next higher pair for the series crystals Y_2 and Y_5 .

The filter is aligned as follows: With the power off the unit, connect the BC-221 output terminal to the output winding of T_1 through a 5- μ uf. capacitor. With the BC-221 set in the center of the pass band (455 kc.) peak the circuit with the r.f. probe on the transformer terminal. Move

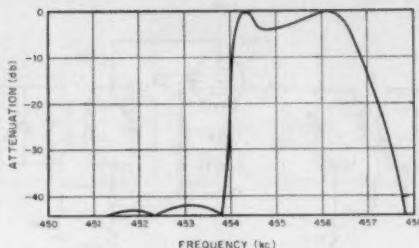
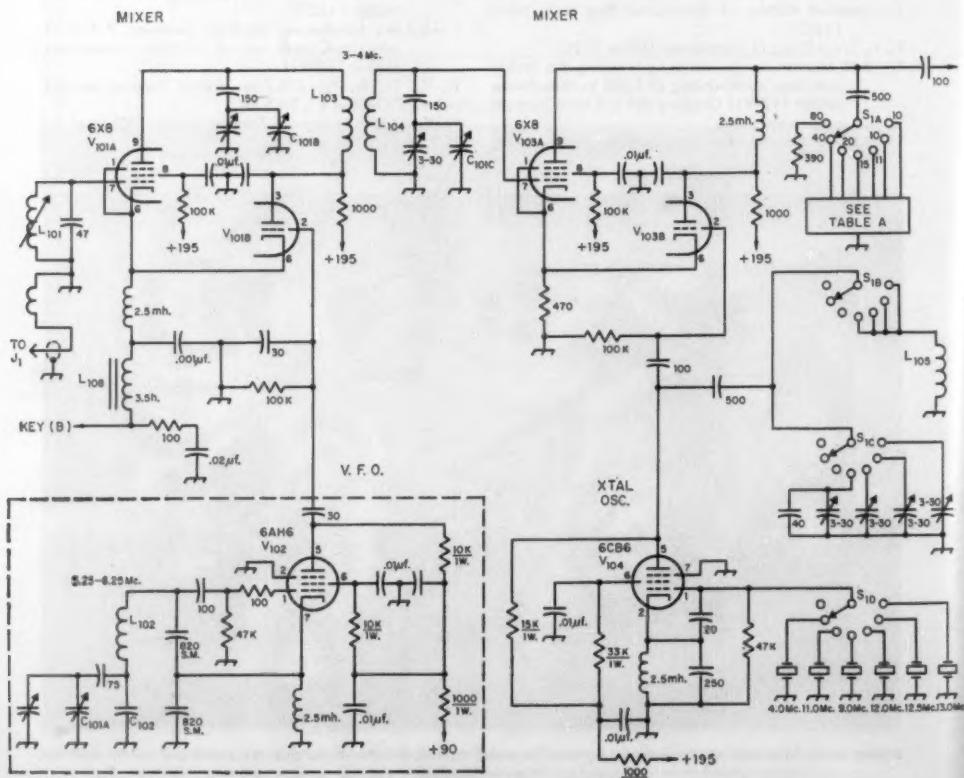


Fig. 3—Pass band of crystal filter after correct adjustment.

the leads and repeat for the windings of T_2 , T_3 and the plate winding of T_4 . Remove the crystal from the oscillator and connect the BC-221 output to the crystal socket.

Remove the 6X8 multiplier, V_4 , and temporarily ground the amplifier grid resistor at (E) and the audio feed to the diode modulator at (A). With the balanced modulator unbalanced by turning the arm of the 500-ohm potentiometer to one end, apply power and connect the r.f. probe to the plate of V_2 . Peak all trimmers in the filter.

Fig. 4. (See facing page.)



The pass-band and side-band rejection of the filter can be checked by moving the BC-221 across the filter frequencies. By small trimmer adjustments and rechecking, a suitable curve should be obtained. The curve of this particular unit is shown in Fig. 3. In constructing five such filters, similar curves have been obtained in each case without resorting to crystal grinding or overly-tedious selection.

After filter alignment is complete, replace the 6X8, the oscillator crystal, and unground point (A). With an audio oscillator fed to the balanced modulator through an ARC-5 receiver output transformer, which will be mounted later on the main chassis, retune the T_4 windings with the r.f. probe connected to the output winding of T_5 at J_1 .

The pass band can be checked, which will give an opportunity to judge the relative position of the crystal oscillator frequency. Modification of the $10-\mu\text{f}$. capacitor at the plate of V_{1A} may be necessary to move the oscillator to the right frequency.

With the audio input at zero, balance the 500-ohm potentiometer for minimum carrier. The $50-300\mu\text{f}$. mica trimmer should aid the balance. If not, connect it to the other side of the poten-

tiometer. Mixer balance is obtained with the 2000-ohm potentiometer at V_S , but this is not a critical adjustment.

Main Chassis Construction

Before laying out the main chassis it will be easier to build the bandswitch assembly. This is built in two parts: first the conversion oscillator and second the mixer/amplifier.

The oscillator section is built using three Centralab GGD switch sections assembled on a P-272 index assembly. A $1\frac{1}{4}$ by $2\frac{3}{4}$ -inch aluminum plate is mounted on the rear using the switch assembly bolts. This plate holds the four trimmers. The switch shaft is cut off behind the assembly so that a metal $\frac{1}{4}$ -inch shaft coupling can be attached for coupling to the mixer/amplifier section. This facilitates removal of the mixer/amplifier switch assembly.

Referring to Fig. 4, S_{1B} , S_{1C} and S_{1D} are the oscillator switching sections. Since the crystal oscillator is a screen feed-back type, when no output circuit is connected, fundamental output will result. This is used for conversion to 40 and 20 meters with crystal frequencies of 4.0 and 11.0 Mc. respectively. Converting to the higher bands requires an output circuit tuned to the second

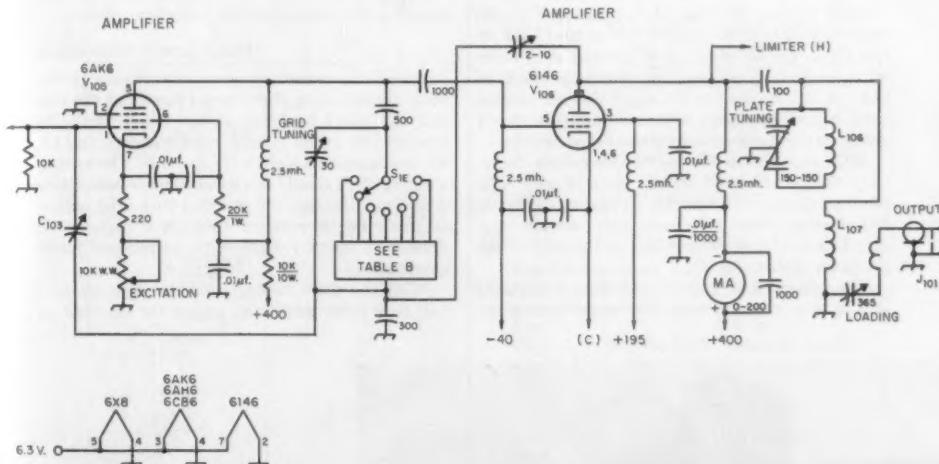


Fig. 4—Diagram of the r.f. circuit following the side-band generator of Fig. 2. Unless otherwise indicated, capacitances are in μf , resistances are in ohms, resistors are $\frac{1}{2}$ watt.

C_{101} —Triple 150- μf . variable (from 3- to 6-Mc. ARC-5 receiver)

C_{102} —4.7 μf . N330 and 30 μf . NPO in parallel.

C_{103} —Small capacitor made by winding several turns of insulated wire around lead to pin 1 of V_{105} . Adjust by changing number of turns.

L_{101} —80 turns No. 36 enam. on $\frac{1}{8}$ -inch diam. slug-tuned form (Miller 4400). Link is 3 turns wound over bottom end.

L_{102} —24 turns No. 26 enam. on 1-inch diam. threaded ceramic form, with half-turn loop for adjustment. See text. (National XR-60 with slug removed.)

L_{103} , L_{104} —40 turns No. 34 on $\frac{1}{2}$ -inch diam. slug-tuned form. (National XR-50). Spaced $\frac{3}{4}$ -inch on centers.

L_{105} —17 turns No. 18 enam. on $\frac{1}{4}$ -inch diam. form.

L_{106} —9 turns No. 18 wound 8 t.p.i. 1-inch diam. (B&W 3014).

L_{107} —21 turns No. 20 wound 16 t.p.i., 1-inch diam. (B&W 3015). Link is 8 turns No. 18 enam. over cold end.

L_{108} —3.5-h. choke. (No. 5634 from ARC-5 receiver.)

S_1 —See text. S_{1A} and S_{1B} wired to short unused mixer and amplifier coils.

harmonic of the crystal. Therefore, the coil L_{105} is switched in by S_{1B} while S_{1C} connects a trimmer on each of the upper bands for resonating L_{105} to 18.0, 24.0, 25.0, and 26.0 Mc. These convert the 3.0-Mc. side-band signal to 21.0, 27.0, 28.0 and 29.0 Mc. The lower 40 kc. of the 11-meter band is covered below zero on the main dial.

The mixer/amplifier switch assembly is built on a 3×6 inch L-shaped bracket with a $\frac{1}{2}$ -inch mounting foot, as shown in one of the photographs. One GGD switch section is mounted on each side of the plate. The amplifier or rear side is shown. The coils are mounted by threading them on a 1-inch brass bolt with head removed, which passes through the plate. Before threading the coils on, a nut is placed on each side of the plate, with a soldering lug under the mixer side. The poly forms can be softened enough for easy threading by filling the hole in them with coil dope. For mechanical convenience, a 100- μ uf. capacitor is connected directly from the mixer plate to the amplifier grid. Then only one lead is required from the common switch terminal to the mixer plate, making easier installation possible. The same arrangement is used between the 6AK6 and the 6146.

All tuned circuits on the amplifier side are insulated from ground and bypassed by a 300- μ uf. capacitor, across which the neutralizing voltage for the 6AK6 and the 6146 is developed.

Since mixing in V_{103A} is not required on 80 meters, a resistor is used for the output load on this band. On 40 meters a series trap (see Table A) is used to shunt out the second harmonic of the 4.0-Mc. oscillator. To short out all unused coils, one of the spare switch terminals is wired across to the common side of the tuned circuits.

After completion of the bandswitching units, they can be mounted on the main chassis. The piece of shaft cut from the oscillator section is slid through the mixer-amplifier section and attached to the shaft coupling at the rear of the oscillator section.

The underside of the v.f.o. section is enclosed in a $3 \times 4 \times 5$ -inch box. The main tuning ca-

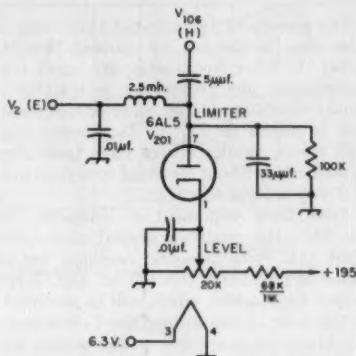


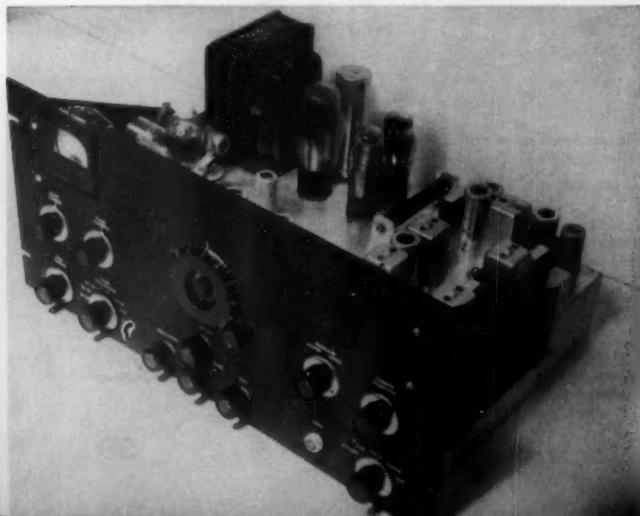
Fig. 5—The limiter circuit samples the r.f. output and reduces the r.f. gain if the signal exceeds the bias level.

pactor and diode modulation transformer were taken from a 3- to 6-Mc. ARC-5 receiver. V.f.o. coil L_{102} is made with an extra half-turn loop through the inside of the form, for fine adjustment of the inductance. The 2500-ohm dropping resistor in the power supply (Fig. 7) is mounted on top of the chassis, since it dissipates about 25 watts. New mounting brackets will protect the terminals from accidental contact. The limiter, V_{201} , is mounted on an L-shaped bracket between the 6146 and the power transformer, to prevent coupling the output circuit under the chassis.

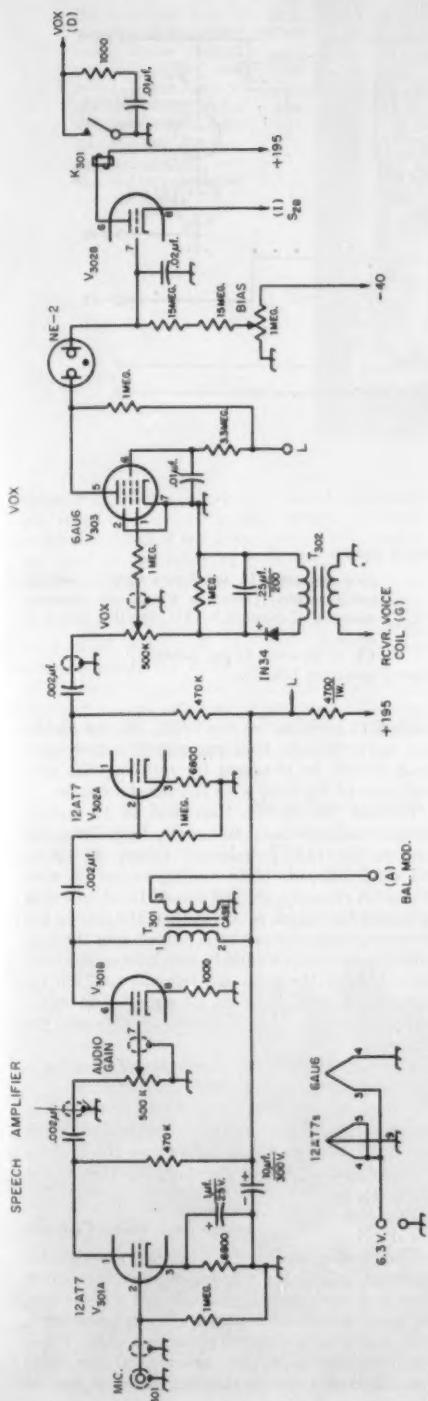
Main Chassis Alignment

Attach the side-band generator chassis to the main chassis using sheet metal screws at the rear and the panel bushings at the front. With the band switch on 80 meters, carrier control full on, set the operation switch S_2 to v.f.o. The output winding of T_5 should be repeaked after connecting it to V_{101A} through the shielded lead. The output of the v.f.o. is reduced through a capacitance divider to about 1.4-2.0 volts, to prevent mixer overloading.

With the main tuning capacitor C_{101} set at a half turn from minimum, adjust the trimmer on



This complete side-band transmitter uses a filter made from inexpensive low-frequency crystals. The frequency control utilizes the tuning gang from an ARC-5 receiver. The dial has been recalibrated to read 0 to 1.0 Mc.



C_{101A} until the mixer output is heard on a receiver at 4.0 Mc. Peak the other trimmers on C_{101} by connecting an r.f. probe to the cathode of V_{103} . It may be necessary to listen first in a receiver for the peak until enough signal is getting through the double-tuned circuit to indicate on the meter. Close capacitor C_{101} to three turns from maximum and tune the slugs of L_{103} and L_{104} for maximum output. Repeat until the circuits track with the v.f.o., as indicated by the r.f. probe on the cathode of V_{103} .

The v.f.o. tuned circuit values have been chosen to give a reasonably linear dial, with 4.0 Mc. falling $\frac{1}{2}$ turn from minimum and 3.0 Mc. occurring about three turns from maximum. If a general-coverage receiver with a calibrator is available, the 3.0-Mc. end can be checked at this point; otherwise it can be checked indirectly later.

The 6AK6 output tuning can next be checked over the 80-meter band to make sure that the $30-\mu\text{f}$. panel control will tune the range. Next check the neutralization of the 6146 by connect-

Table A—Mixer Coils

Each coil wound on 1½-inch long $\frac{3}{8}$ -inch diam. polystyrene rod.

Each coil shunted by 3-30- μ uf. trimmer
Band Coil

40 m. 33 turns No. 30 enam., shunted by trap of 80 turns No. 36 enam. on $\frac{1}{4}$ -inch diam. slug-tuned form (Miller 4500) in series with 10 muf.

20 m.	24 turns No. 26 enam.
15 m.	12 turns No. 22 enam.
11 m.	10 turns No. 18 enam.
10 m.	9 turns No. 18 enam.
10 m.	9 turns No. 18 enam.

Table II—6AK6 Coils

Each coil wound on 1-inch long $\frac{3}{8}$ -inch diam. polystyrene rod. Each coil shunted by 3-30- μ uf. trimmer unless otherwise noted.

Band	Coil
80 m.	70 turns No. 36 enam., shunted by fixed 30 μ uf.
40 m.	33 turns No. 30 enam.
20 m.	17 turns No. 22 enam.
15 m.	9 turns No. 18 enam.
11 m.	8 turns No. 18 enam.
10 m.	7 turns No. 18 enam.
10 m.	7 turns No. 18 enam.

Fig. 6—Speech amplifier and VOX circuits. Unless otherwise indicated, resistances are in ohms, resistors are $\frac{1}{2}$ watt.

K301—5000-ohm s.p.d.t. relay (Potter-Brumfield SM5LS).
T301—8-to-1 turns ratio output transformer (ARC-5 receive output, No. 5631).

T302—7K-to-50-ohm plate-to-line transformer, reversed (Triad A-51X).

J301—Microphone jack (Amphenol 75-PC1M)

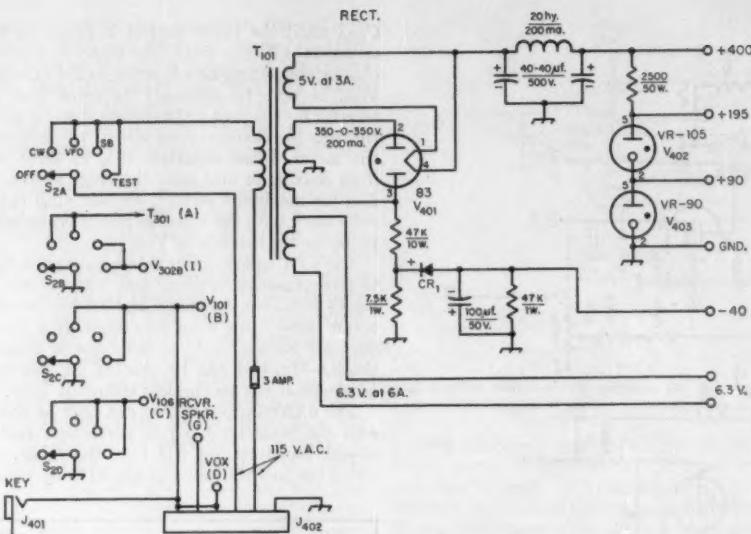


Fig. 7—The power supply section.

J401—Open-circuit phone jack.

108—6-prong tube socket for external conditions.

S₂—Made of one 2-pole 5-position (4 used) shorting phenolic switch section (Centralab C) and one 2-

pole 5-position (4 used) non-shorting phenolic switch section (Centralab K) on one indexing assembly (Centralab P-121). Shorting section is S_{4,5}.

CR₁—130-volt 65-ma. selenium.

T₁₀₁—Replacement power transformer (Thordarson 22R07).

ing the r.f. probe in the antenna output connector. (The cathode of the 6146 is open in this position of S_2 .) With grid and plate tuning capacitors peaked for maximum output, set the 2-10- μ uf. neutralizing capacitor for minimum output. If this does not fall within the range of the neutralizing capacitor, change the value of the 300- μ uf. capacitor.

To neutralize the 6AK6, disconnect the B+ at the 10K 10-watt resistor and, with the r.f. probe on the plate, adjust C_{103} for minimum feed-through. This completes 80-meter alignment and a rough neutralization which should be checked later on a higher band. Output can be checked by putting the operation switch to "test" with carrier inserted.

With the band switch on 40 meters, check the output of the crystal oscillator with the r.f. probe. With the receiver dial at 7.0 Mc., tune the v.f.o. dial until the signal from the mixer is heard about three turns from maximum capacity. (The 80-meter second harmonic will be heard with the capacitor about half open.)

If this calibration does not fall fairly close, with the bottom cover on, move the half-turn loop in L_{102} until it does. Set the main dial to about the center of the band as indicated by the receiver, with the $30-\mu\text{f}$. grid-tuning capacitor in mid-range, and peak the active trimmer capacitors at S_{1A} and S_{1E} . Check the plate tuning of the 6146 at the same time. Repeat in the center of each band with the trimmers for the

band, first peaking the oscillator trimmer on the four upper bands. Uniform output across each band should be obtained by retuning the grid and plate of the 6146 with the panel controls.

To tune the 8.0-Mc. trap used on 40 meters, set the band switch on 40 meters, S_2 to Test, and remove the 12AU7 balanced mixer, V_3 . With the dual 150- μ uf. plate tuning capacitor near minimum capacity, output should be obtained as indicated by the r.f. probe. Adjust the slug in the series-trap inductor until the output goes through a minimum, which should be nearly zero. Recheck the tuning of the 3-30- μ uf. trimmer at 7150 kc. with the 12AU7 back in its socket and again recheck the trap if it is necessary to move the trimmer.

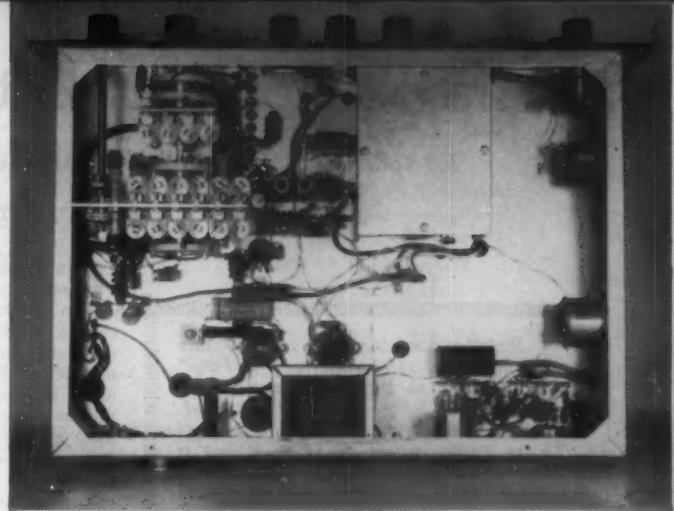
Recheck neutralization on one of the high-frequency bands and alignment is complete.

A temporary dial calibration can be placed on tape run around the edge of the main dial. Make the .5-1.0 portion at 80 meters and the 0-5 on 15 meters if a general coverage receiver is not available.

Audio and Voice Control

The audio and voice control circuits are mounted behind the side-band generator chassis on the main chassis. A small plug-in relay is used for silent control of whatever circuits are desired. The audio gain and voice control gain (VOX) potentiometer leads are brought to the front panel through two-wire shielded cables. A positive

The v.f.o. coil, L_{102} , is housed in its own shield section (upper right of center) and the two coils L_{101} and L_{103} are mounted nearby at the left. Output jack, fuse, J_{401} , J_{402} and the bias potentiometer are mounted on rear apron of chassis.



voltage is developed across the $0.25-\mu\text{f}$. capacitor from rectified receiver audio, which prevents speaker operation of the voice relay. The shielded input lead is grounded at both V_{301A} and the mike input jack. After the audio wiring is complete, with the VOX pot set the bias to zero, by turning the arm to the ground end. The relay should close. Back the bias pot off from the ground end until the relay opens.

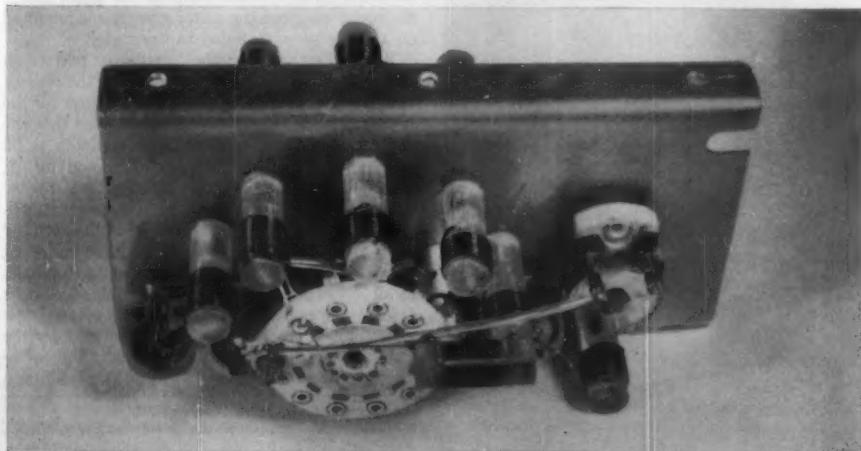
With the mike gain and VOX gain pots turned to suitable values, the relay should close instantly with speech but hold over by an amount determined by the RC constant in the grid of V_{302B} .

Main Tuning Dial

After the unit is complete, a permanent tuning dial can be made. The one shown is from an

ARC-5 transmitter and gives a larger scale than a receiver dial. The old calibration was removed by slipping the dial over the shaft of a grinder and tightening a nut. The grinder was turned on and sandpaper held against the dial until the old calibration was gone. Four coats of flat black spray paint were applied, with fine sanding between coats. The plain dial was attached to the capacitor shaft so a small scratch could be placed every 25 kc. The short line decals are easily lined up by cutting them about $\frac{1}{2}$ inch long and turning the excess over the back of the dial. After leaving the dial overnight, lacquer thinner was applied sparingly to remove the binder. This leaves shiny spots on the dial which are eliminated by spraying a coat of clear plastic over the whole dial. The result is a professional-looking dial with very little expense.

Assembly of the coils described in Table B.



A Transistorized Grid-Dip Meter

1.3 to 35 Mc. Range; Self-Contained; Pocket-Size

BY HARRY M. NEBEN*, W9YVZ

Strictly speaking, we suppose this shouldn't be called a "grid-dip" meter since transistors don't have grids. But whatever it may be called, it's a mighty handy little instrument to have around. Because it has a built-in battery supply it can be used anywhere at any time, whether there's a nearby power line or not.

THE GRID-DIP meter is one of the ham's most useful tools. Through its use it is possible to measure the self-resonant frequencies of coils, to tell if a circuit is "in the band," and to determine whether that second stage is doubling or tripling. With the help of a few simple auxiliaries, it is also possible to measure such quantities as inductance and capacitance. However, most grid-dip meters have one disadvantage — there is a cord connected either to the power supply or to the power line. This cord can be a nuisance. The meter described is self-contained and is small enough to fit into a pocket.

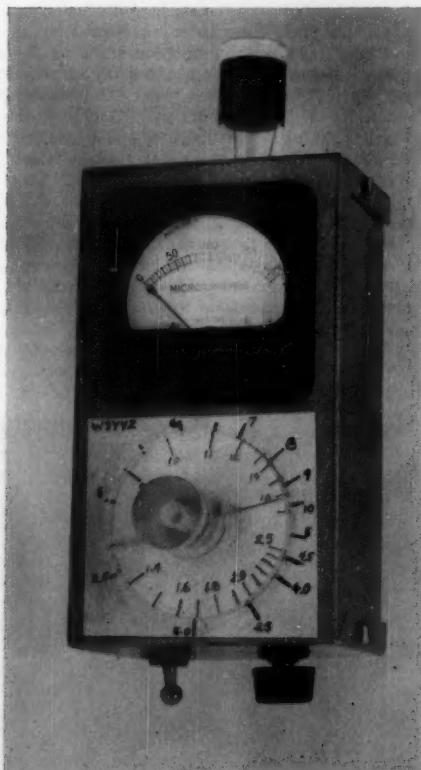
The oscillator circuit for this grid-dip meter is built around a type 2N247 transistor. This transistor has a cut-off frequency of 30 megacycles, and little difficulty was encountered in getting it to oscillate at that frequency. The output of the oscillator is coupled through a small capacitance to a 1N34A diode rectifier having a variable load resistance so the rectifier output can be adjusted to stay within the maximum range of the d.c. meter used as an indicator. A CK722 transistor amplifier is used to increase the sensitivity of the meter, with a circuit similar to that described by W1CUT in November 1957 *QST*.¹

Construction

The oscillator and meter amplifier are built in a $3 \times 2\frac{1}{8} \times 5\frac{1}{4}$ inch aluminum box. As shown in the photographs, the meter and tuning capacitor are mounted on the top of the box; the coil socket is on one end, and the meter adjustment control (R_4) and on-off switch (S_1) are on the other end. Oscillator components are mounted on a terminal strip in the space beside the meter case and the meter amplifier is mounted on a lucite piece fastened to the meter.

When first wired, the oscillator performed successfully up to 20 megacycles using the resistor values recommended by the manufacturer for the 2N247. Further experimentation showed that the circuit could be made to oscillate reliably to 30 megacycles by using the values shown for R_1 and R_2 . It is recommended that these two resistor values be adjusted experimentally to give optimum performance with the individual 2N247 used. One 2N247 on hand required 1000 ohms at R_1 while another required 3300 ohms for optimum operation; thus the values shown, while typical, are not absolute.

The r.f. from the oscillator is rectified by the 1N34A and the d.c. output fed into the meter amplifier. It is necessary to limit the minimum



Built in a small "mini-box" type case, this pocket-size oscillator uses a pair of transistors, one as the oscillator and the other as a d.c. meter amplifier. The battery supply is contained in the case.

* 11316 S. Oakley Ave., Chicago 43, Ill.

¹ Campbell, "Transistorized Meter Sensitizer," *QST*, November, 1957.

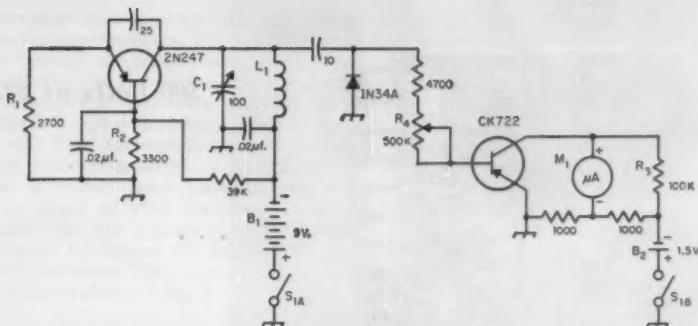


Fig. 1—Circuit of the transistorized grid-dip meter. Capacitances are in μF . except where specified otherwise; fixed resistors are $\frac{1}{2}$ watt. Fixed capacitors are ceramic.

B₁, B₂—Penlight cells.

C₁—100- μF . midget variable.

L₁—1.3–2.5 Mc.: 140 turns No. 32 enam.

2.5–5 Mc.: 60 turns No. 28 enam.

5–10 Mc.: 20 turns No. 28 enam.

10–20 Mc.: 10 turns No. 18 enam.

20–35 Mc.: 5 turns No. 16 enam.

All close-wound on $\frac{3}{4}$ -inch diameter polystyrene forms (Amphenol 24-5H).

M₁—Microammeter or 0–1 milliammeter.

R₁, R₂, R₃—See text for discussion of values.

R₄—0.5-megohm volume control.

S₁—D.p.s.t. toggle.

value of the load resistor to 4700 ohms to prevent pulling the oscillator out of oscillation. The setting of the 0.5-megohm rheostat with its limiting resistor does not seriously affect the frequency calibration of the oscillator.

The meter amplifier is a familiar circuit to most transistor fans. As an exact zero setting of the meter is not required, resistor R₃ simply can be adjusted so that the meter reads near zero when the oscillator is not functioning. The meter used in the pictured unit was a 200-microampere surplus meter. Meters of other ranges such as a 0–1 ma. may be used and R₃ chosen to give zero reading with the oscillator not operating. In fact, if a 25-microampere meter is used, the CK722 amplifier may be omitted and the meter connected directly between the bottom of R₄ and chassis.

Calibration and Use

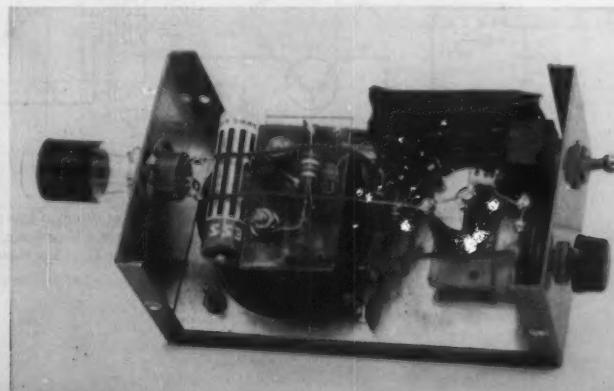
The grid-dip meter can be calibrated from any general coverage communications receiver. However, care must be taken to see that it is not accidentally calibrated on the receiver image instead of on the true signal frequency.

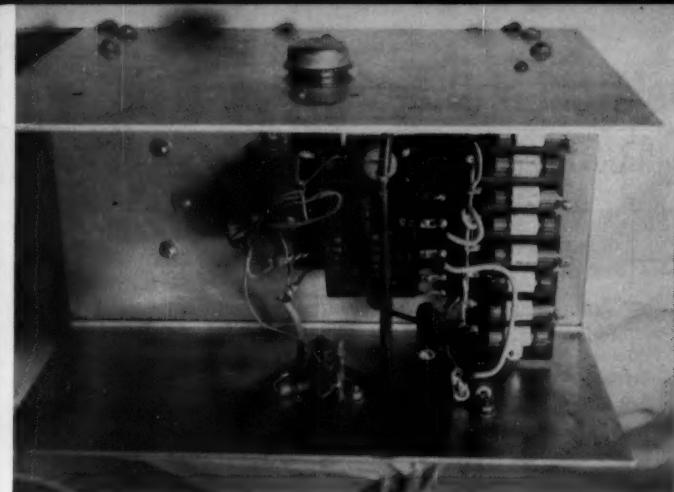
Wind the highest-frequency coil first, and get

the circuit oscillating satisfactorily by adjusting R₁ and R₂, if necessary. Then wind the lowest-frequency coil and note the highest frequency to which it will tune. If desired, this band may be marked on the dial; 100-ke. steps are convenient. Then wind the second 2.5–5 Mc. coil. This order is recommended as it is easier to adjust coils by removing turns than by adding them or winding a new coil. Wind a few more turns than recommended in the coil table and then take off turns until the low-frequency end of the second coil range just meets the high-frequency end of the first coil range. Cement the turns in place and calibrate this coil on the dial. For the second range it is recommended that points each 500 kc. be marked on the dial. Repeat the procedure, making the low-frequency end of the third range just meet the high-frequency end of the second range. Mark the dial in 1-megacycle steps. Then proceed in the same manner with the fourth and fifth coils.

Methods of using the grid-dip meter have been described many times in magazine articles and in the *ARRL Handbook*. Once one has a good grid-dip meter it becomes indispensable. This pocket-size meter is an especially convenient one.

The oscillator circuit components, with the exception of the tuned circuit, are mounted on a lug strip just to the right of the meter in this view. The small plastic plate fastened to the meter terminals serves as a mounting board for the meter amplifier components. Penlight cells for the oscillator supply are held in place with plastic tape.





500 Volts at 225 Ma.

A 500-volt 225-ma. transistor power supply for mobile use. The transistors are mounted on large aluminum surfaces to provide cooling. Rectifiers are silicon.

100-Watt Transistor Mobile Power Unit

BY ROBERT L. KARL,* W8QFH

THE POWER transistor of the type designed for switching at low frequency is ideally suited for use in mobile power supplies. However, the general lack of suitable components and design data has kept most amateurs from taking advantage of the features that supplies of this type have to offer. It is hoped that an account of some experimental work done by the author, with assistance from W9MZN, W8ZM and W8BNG, will be of interest to others who are contemplating a similar project.

The design was aimed at a transistor supply that would replace the old stand-by PE103 used to power a 50-watt mobile rig. An output of 500 volts at 225 ma. was needed. While several suitable transistor types are now on the market, the 2N278 was selected for the job. This unit is readily available. It can be obtained from

*22060 Charter, Detroit 41, Mich.

United Motors dealers who service Delco receivers throughout the United States. The price, although somewhat high, is not prohibitive. The 2N278 has a maximum current rating of 12 amperes and operates from a 12-volt car-battery system.

Fig. 1 shows the circuit of the first experimental attempt. The transformer T_1 was designed for a frequency of 400 cycles and was wound on a core of stacked 0.014-inch hi-nickel silicon laminations. ("Audio C" core material is also suitable.) In addition to the high-voltage secondary L_3 and the 12-volt primary L_2 , the transformer has a split feed-back winding, L_1 , of 12 to 15 volts.

How the Circuit Works

When voltage is applied to this circuit, one of the transistors will start conducting more

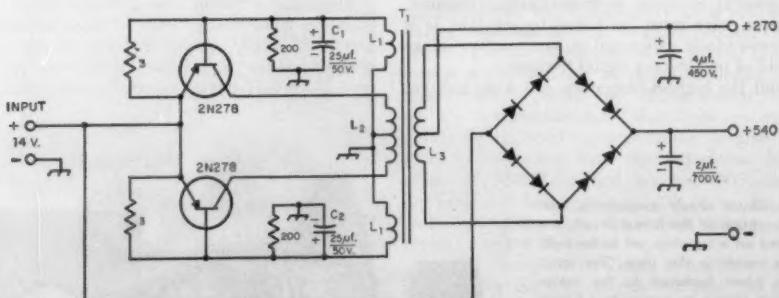


Fig. 1—Circuit of the first experimental transistor mobile power supply. Capacitors are electrolytic. Resistors are 2 watts or more, and values are in ohms. Rectifier units (8 required) are 130-volt a.c. input, 500-ma. d.c. output silicon (Sarkes-Tarzian M8500). Transformer T_1 is discussed in the text (Powertran P3015 or Meteor M88565). (See footnote 1, page 170.)

than the other because of manufacturing differences in the two transistors. The flow of collector current through the transformer primary is in such a direction as to bias the conducting transistor into greater conduction while the other transistor is biased with the opposite polarity to cut it off. The current continues to increase until the transformer saturates. At this point a reversal of current takes place and the first transistor is cut off while the second is driven into conduction. The resistors aid in the starting of oscillation by biasing the transistors out of the nonlinear region. The output wave is essentially square as shown in Fig. 2.

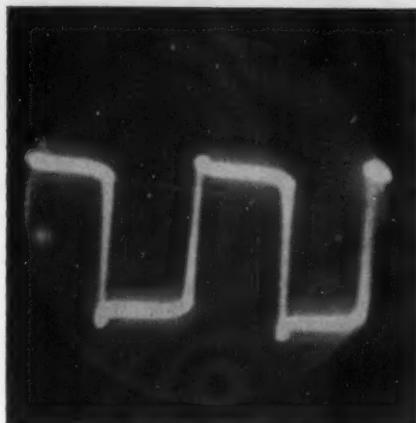


Fig. 2—Oscillograph showing the input waveform of the circuit of Fig. 1 after despiking.

At the instant of reversal, a high-voltage spike is generated by the collapsing field of the transformer. Although of short duration, these spikes can cause transistor failure if their amplitude exceeds the collector diode voltage rating. C_1 and C_2 are used to suppress the spikes as shown in Fig. 2. The amplitude of the spike can also be

limited by the use of transformer core material of relatively high residual magnetism, since with such a core the field does not collapse so abruptly when the magnetizing force is removed.

Improving Efficiency

With the arrangement of Fig. 1, a full-load efficiency of 72 per cent was obtained. At the suggestion of W8ZM, attention was turned to the use of a high-permeability toroid feedback-transformer system and a hypersil power transformer. The circuit used is shown in Fig. 3. In this circuit, it is the small toroid transformer, rather than the power transformer, that saturates to provide chopper action. It is also the frequency-determining element. In this particular case, the frequency checked at 980 cycles. An efficiency of 85 per cent was obtained at a full-load output of 500 volts, 225 ma. With the better core material, no despiking network was found necessary. The network consisting of C_1 , R_1 , CR_1 and CR_2 is for the purpose of suppressing random transient peaks.

The circuit of Fig. 1 provides automatic protection against overload. If the supply is overloaded, the circuit simply stops oscillating. In the circuit of Fig. 3, however, feedback is more independent of the load and therefore overload protection is not automatic. Proper fusing of both input and output circuits is recommended.

In both circuits, silicon diodes are used in the bridge rectifier to conserve space and make it unnecessary to supply rectifier filament power. These rectifiers also help to keep the efficiency up, since the drop across them is much less than with tube rectifiers. To obtain the necessary voltage rating, two diode units in series are required for each leg of the bridge. Since the rectified output on each half of the cycle is very close to a square wave, the output with full-wave rectification requires very little filtering.

The supply shown in the photograph was built by W8BNG and the transformers were designed by W8ZM. The problem of heat sink (cooling) was solved by mounting the two transistors on

(Continued on page 170)

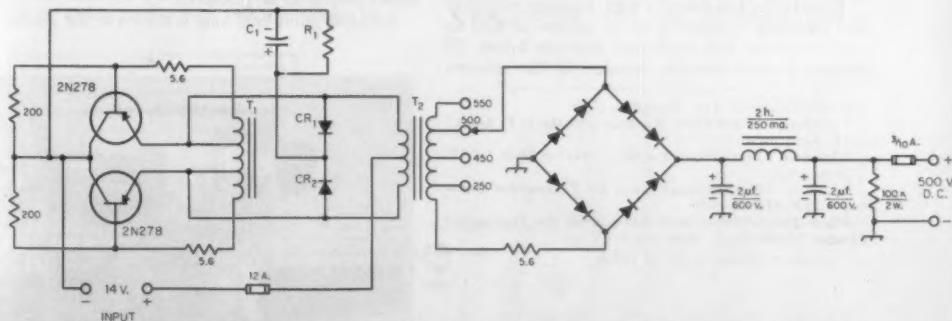


Fig. 3—Transistor power-supply circuit using a toroid feedback transformer and power transformer with hypersil core. Capacitors are electrolytic. Resistors are 2 watts and values are in ohms ($K = 1000$). CR_1 and CR_2 are 70-volt 500 ma. silicon rectifiers (Sarkes-Tarzian 10M500). R_1 is 150 to 500 ohms, 2 watts. C_1 is a 5 to 20 μ 50-volt electrolytic. Power rectifier units (8 required) are 130-volt a.c. input, 500-ma. d.c. output silicon (Sarkes-Tarzian M500). T_1 is the feedback transformer (Osborne 716). T_2 is the 1000-cycle power transformer (Osborne 14572-14) (See footnote 1, p.170).



The direction finder installed on a car, using a homemade window mount. The battery clip at the bottom of the support is the "pointer" indicating the null direction.

The 75-meter phone band offers some interesting possibilities for hidden transmitter hunts — especially if you use simple direction-finding equipment like that described in this article.

INTEREST in the sport of transmitter hunting seems to be confined largely to the 10-meter band. Several excellent articles on transmitter hunting have appeared in *QST* in recent years and these have dealt exclusively with loops designed for operation on this band.^{1, 2, 3, 4}

Here in the Los Angeles area, transmitter hunts are regularly conducted on 75 meters as well as on 10 meters. For week-end daytime hunts, 75 meters is more suitable because of the relative

Transmitter Hunting on 75 Meters

How to Make a Simple Loop and Direction Finder

BY JOHN ISAACS,* W6PZV

absence of QRM and because there is less chance for multiple reception paths.

The author hopes to stimulate some interest in operation on 75 meters by describing two direction finders which are easy to build. One of these has unidirectional properties.

The Simple Loop

The local rules in the Los Angeles area generally recognize the first car in as the winner in the 75-meter hunts. Consequently, some of the participants start out with no special equipment except a receiver. Some of the more advanced in this class also use an S meter. Transmitter hunting in this fashion usually becomes quite frustrating and it is not long before some serious consideration is given to the construction of some kind of loop. Those that have them usually give their 10-meter loops a try first. These work reasonably well on 75 but the sensitivity is low. A tuned loop is to be preferred.

A simple hand-held loop is shown in the photo-

* 1300 California Ave., Compton, Calif.

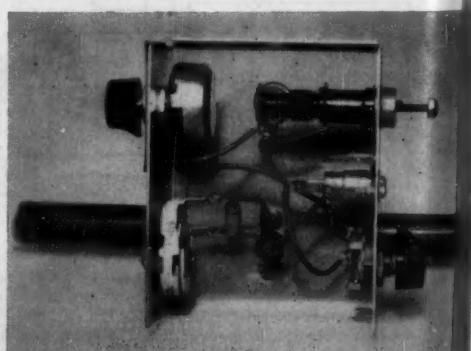
¹ Norberg, "Transmitter Hunting with the D.F. Loop," *QST*, April, 1954.

² Duncan, "Transmitter Hunting — Seattle Style," *QST*, March, 1955.

³ Amtfahr, "Unidirectional Loops for Transmitter Hunting," *QST*, March, 1955.

⁴ Braschwitz, "Directional Antenna for the Transmitter Hunter," *QST*, April, 1956.

All components of the d.f. are mounted on the top and sides of a "Channel-lock" type box. In this view R_1 is on the left wall at the upper left and C_1 is at the lower left. L_1 , S_1 and the output connector are on the right wall. The loop stick and whip mount on the outside.



graph. Fig. 1 gives the circuit. This type of loop is described in the *ARRL Antenna Book*.⁵ The loop is made up of a metal can of the type used for small plastic bandages, two copper tubing fittings, a length of copper tubing, a small tuning capacitor, some hook-up wire and a length of coax cable. The mechanical parts are soldered together and then the tubing is cut and the joint is insulated with plastic electrical tape. The tuning capacitor is mounted in the can.

The hardest part is threading the wire into the copper tubing. Enamel-covered wire will short out, so time should not be spent in using this type of wire. The one-turn link connects directly to the coax cable and this in turn plugs into the receiver. The loop is tuned for maximum output on the desired frequency. The sensitivity is good and the nulls are quite sharp.

Simple Loop Theory

The theory of the loop antenna is adequately covered in the previously-mentioned articles. It should be sufficient to say here that a loop has two null points 180 degrees apart.

Now, two nulls are better than no null at all, but this characteristic causes a slight problem. When the loop is turned until the signal is at minimum the loop gives the line of the hidden transmitter but not its direction. By taking a bearing at two locations it is possible to draw two lines on a map and note where they intersect. This procedure must usually be repeated during the hunt because the accuracy of such a fix is not too great with the equipment ordinarily used. Nevertheless, with a little practice, this bidirectional loop will give good results and will greatly increase the chances of being first at the location of the hidden transmitter.

Something Better

The obvious and ultimate solution is to use some sort of direction finder that will produce only one null as it is rotated. Fortunately, the bidirectional loop can be made to function in this manner by the addition of what is called a "sense antenna." Marine and aircraft direction-finder receivers, which are designed to operate over a fairly wide frequency range, have a rather com-

⁵ The *ARRL Antenna Book*, 1949 edition, page 264.

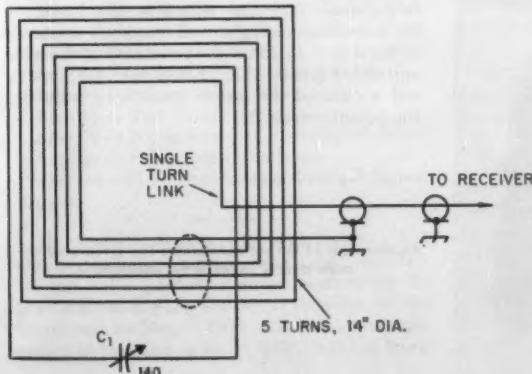
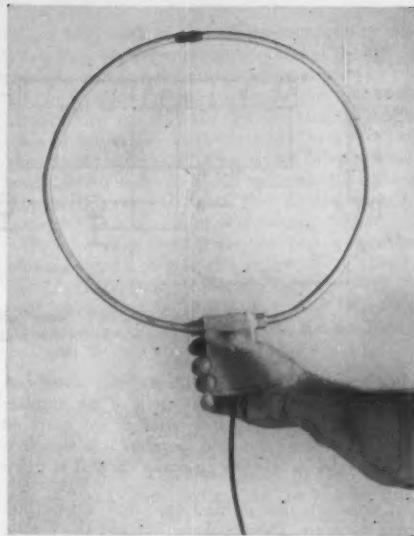


Fig. 1—Circuit of a simple loop antenna for 75-meter work. C_1 , 140 μf ., may be either an air or ceramic variable.



Hand-held simple loop uses copper tubing and a small metal box. This loop uses the circuit of Fig. 1. The tubing is cut at the center opposite the box and the ends insulated from each other by plastic tape.

plicated input circuit. This is necessary so that the outputs from the loop and the sense antenna are always combined in the proper phase relationship. But if a direction finder is to operate on only one frequency, or over a rather narrow range of frequencies, its input circuit can be greatly simplified.

Such a direction finder for 75 meters is shown in the photograph and its circuit is shown in Fig. 2.

Construction Details

The loop portion of this direction finder (d.f.) is actually a loopstick of the variety usually found in portable receivers for the broadcast band. The original winding is removed and a new winding placed over the ferrite core. The loop is tuned to

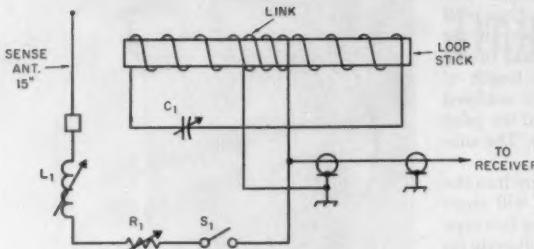


Fig. 2—A short whip as a "sense" antenna combined with a ferrite-core loop forms a direction finder that is compact and easily installed on a car.

resonance by means of C_1 . A grid-dip meter can be used to make final adjustment of the number of turns of wire. This loop stick is not quite as sensitive as the hand-held loop but it is sensitive enough, and it is easier to make up and is more compact.

A two-turn link is used to obtain an output from the loop. This is placed around the center of the core.

The sense antenna consists of a 15-inch whip, an adjustable inductance that will resonate the

C_1 —140 μ uf. variable (125- μ uf. ceramic trimmer in parallel with 15- μ uf. ceramic fixed).

L_1 —Approx. 140 μ h., adjustable (Miller No. 4512 or equivalent.)

R_1 —1000-ohm carbon potentiometer.

S_1 —S.p.s.t.

Loopstick—Miller No. 705-A, with original winding removed and wound with 20 turns of No. 22 enam. Link is two turns at center. Winding ends secured with Scotch electrical tape.

whip as a quarter-wave antenna, and a potentiometer to control the output of the antenna. The switch is used to disconnect the sense antenna during the tune-up procedure.

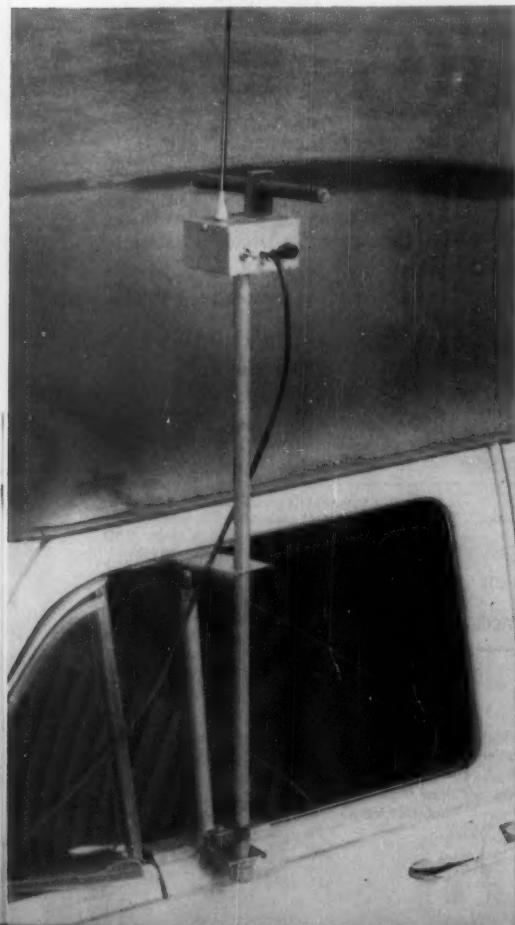
The whip was secured from a local auto supply store for 89 cents. It came attached to a large suction cup and was intended to be mounted on the roof of a car and thereby create the impression that the owner had a radio telephone in the car. Any antenna of the same length, or longer, will do as well. If a longer one is used the inductance of L_1 will have to be reduced proportionately.

The whip, the loop stick, the inductance L_1 , the capacitor C_1 , the potentiometer R_1 , and the switch S_1 are all mounted on a $2 \times 3 \times 4$ -inch box chassis. The loopstick is mounted and protected by means of a piece of $1/2$ -inch thick laminated plastic and a length of fiber tubing which fits over the entire loop stick. A section of $1/2$ -inch electrical conduit is attached to the bottom of the chassis box and this supports the d.f. The photographs show a close-up of the d.f. as well as the complete unit mounted on a car and ready for a hunt. A large battery clip serves as a direction indicator.

Direction-Finder Theory

To produce an output having only one null it is necessary that the outputs of the loop and the sense antenna be combined. There must, however, be a 90-degree phase difference between the two and also the signal strength from each must be the same. The phase shift is secured by tuning the sense antenna slightly off frequency by means of the slug in L_1 . Since the sensitivity of the whip antenna is greater than that of the loop, its output is reduced the proper amount by adjusting the potentiometer R_1 .

Another view of the car installation. The sense antenna is more clearly visible in this photograph.



Tune-Up Procedure

The initial tune up of the direction finder is a little critical and time consuming but after it is completed any subsequent adjustments will be very easy.

The author has never tried to tune the direction finder by using a grid-dip meter or small oscillator. Possibly the initial rough adjustment could be done in this manner. The final adjustment at least should be done under field conditions. The larger the field the better. The presence of power lines or telephone lines will introduce some error in the directional properties of the d.f. Under operating conditions they will cause a little error at times but it is just a temporary condition and subsequent readings will put you back on the beam.

The author uses a small battery-operated transmitter with a built-in vertical antenna (BC-745). A friend's mobile rig would work fine, also, but the output should be reduced as much as possible. The car with the direction finder is parked about 300 feet from the test transmitter. Remove your transmitting antenna before trying to make any loop adjustments and remember to leave it off during transmitter hunts. With the test transmitter operating on the proper frequency, disconnect the sense antenna with switch S_1 and peak the loop stick using C_1 and watching the S meter on the receiver. If no S meter is available one should be installed before the direction finder project is started. Once the loop stick is peaked, no further adjustment of C_1 will be necessary. Now connect the sense antenna and turn R_1 to minimum resistance. Then vary the adjustable slug of L_1 until a maximum reading of the S meter is again noted. It may be necessary to turn the d.f. a bit during this adjustment to obtain a larger reading than with the loop stick alone. The last turn of the slug is quite critical and some hand capacitance effect may be noted.

Now turn the d.f. so that one side (not an end)

of the loop stick is toward the test transmitter. Turn R_1 a complete revolution and if the proper side was chosen a definite null should be observed on the S meter for one particular position of R_1 . If not, turn the d.f. 180 degrees and try again. This time leave R_1 at the setting which produces the minimum reading. Now adjust L_1 very slowly until the S-meter reading is reduced still further. Repeat this several times, first R_1 and then L_1 , until the best minimum is obtained.

Finally, as a check have the test transmitter move around the d.f. and follow it by turning the d.f. If the tuning has been done properly the null will always be broadside to the loop stick. Make a note of the proper side of the d.f. for the null and the job is finished.

Using the Direction Finder

The technique of using the d.f. is simple and it only takes one transmitter hunt to become an expert. There is no need to triangulate as with a simple loop. It is just necessary to keep the d.f. tuned for a null reading. As the hidden transmitter is approached the d.f. must be turned in order to continue to get a null.

It is a good idea to continue on in the original direction until the d.f. indicates that the transmitter is at right angles to line of travel. At this point a right-angled turn toward the transmitter should be made if possible and the procedure repeated until destination is reached. If the hidden transmitter is kept dead ahead at all times it is difficult to get an accurate impression as to how far away it is except by signal strength.

One more pointer: If the area in which the transmitter will be hidden is known ahead of time it is a good idea to start out from the center of this area. (Of course, local rules may preclude this possibility.) The fellow with the simple loop will generally start out near the edge of a known area and you will on the average have a head start on him.

Strays

Here's the schedule for the MARS (AF) Eastern Technical Net for the month of June, same frequencies as previously.

June 1 — Electronic Flight Test Equipment

June 8 — Antenna Symposium

June 15 — The Engine Scope

June 22 — Nucleonics and Radiological Safety

June 29 — Education's Challenge

The net will be closed down during July and August.

Mr. Ludwig Arnson, who sent history's first maritime wireless distress signal, died recently. He was radio (pardon, wireless) operator on the liner *Koonland* when she lost a propellor off the Irish coast on Dec. 7, 1903. A British cruiser appeared in response to his "CQD," that call being

the predecessor of "SOS." Mr. Arnson later became president of the Radio Receptor Co., Inc.

W8TZQ notes that there is currently listed for sale in a certain classified section a 6-volt dynamotor with an output of 400 volts at 1375 amperes.

K2AEQ recently worked DJ2HC on 3.5 Mc. while using a transistor transmitter with a power input of 1500 mw. This was on March 31 at 10:30 P.M. EST, and he wonders if this is a first transatlantic QSO with a transistor rig.

W5APM, parked across the street from a funeral parlor, broke up the services when he called CQ and came through on the p.a. system.

A Weather-Resistant Quad

Fiberglas Spreaders in a Two-Band Beam

BY DAVID R. WEINSTOCK,* K9GFV

Another method of supporting a quad antenna. This one makes use of Fiberglas fishing-pole stock to replace the customary bamboo spreaders which have a tendency to deteriorate when exposed to weather.

OVER THE past several years there have been enough articles on cubical quads to fairly well establish various dimensions and specifications, although it will be shown later that these do not always hold true. The mechanical form has also generally followed a somewhat standard appearance. Performance and economy in building have been among the major attractions to the prospective antenna builder.

This article will deal only briefly with the electrical considerations and is primarily intended to provide information for the construction of a strong, lightweight, weather-resistant quad.

About eight months ago a commercial 10/15-meter quad was put up at the home QTH. This quad was conventional, as most, and used bamboo fishing poles for the spreaders. After several months' use, it was noticed that there was quite a bit of play in the connections between the boom and the end supports and, as a consequence, the bamboo spreaders whipped considerably in any kind of a breeze. It was at that point that the

* 70 Oakvale Road, Highland Park, Ill.

decision was reached to build a more rugged structure.

This antenna can be built for considerably less than what it cost me, if the builder has time to visit junk yards and second-hand-metal dealers and has access to some machine tools. Not being too skilled myself, nor having access to the necessary power tools, and not being able to leave my business, it was necessary for me to buy the materials new and to have the machine work done in a commercial machine shop.

The raw-material cost was \$50.00, including wire, coax connectors, and other hardware. The machine-shop work was \$38.00. Between the junk box, second-hand stores and do-it-yourself, it should be possible to build this quad for about \$40.00 to \$45.00. Naturally, quads can be built more reasonably, but some of the features of this one would then have to be sacrificed.

To meet my requirements with a minimum use of nuts and bolts, my first step was to decide on what materials to use for the two most important parts — the spreaders and supports for the spreaders.

Spreaders

While walking through a sports store one day, I noticed a still-fishing pole made of four telescoping Fiberglas sections. These sections are each approximately 52 inches long and are tapered inside and out so that the ends may be telescoped to taper lock at the joints. Two of these sections were used for each spreader, giving a total length on each leg of about 8 feet 4 inches. A thin varnish spray was applied to the end of the smaller section where it locks with

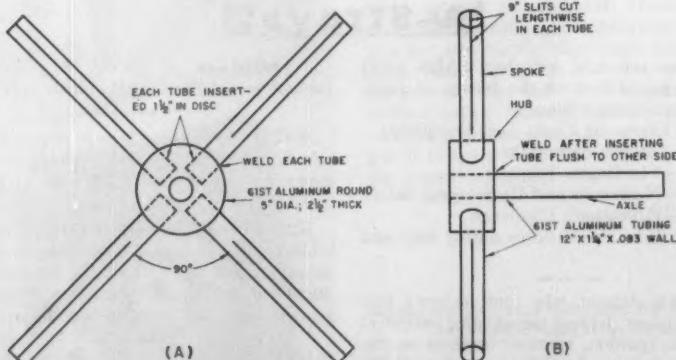


Fig. 1—A—Aluminum-tubing "spokes" inserted in a "hub" of heavy aluminum serve as mountings for the Fiberglas spreaders. B—The "hubs" that support the quad spreaders are fitted with "axles" that slide into the ends of the boom.

the larger-diameter section. This was done to provide a tighter and stronger locking effect at the joint.

The Fiberglas sections were obtained from the factory that makes the fishing poles and which happens to be located in Chicago. Although the sections were seconds as far as fishing poles are concerned, they were first class for my purpose.

The inside diameter of the two sections joined together starts at $1\frac{1}{4}$ inches and then tapers down to approximately 0.75 inch at the end of the 8-foot 4-inch length. The outside diameter is approximately 1.33 inches at the butt end and 0.83 inch at the small end. These dimensions provide a strong spreader which does not sag and has very little whip. Best of all is the weather resistance of the Fiberglas. A small cork was tapped into the end of each pole, plastic tape was wrapped over and around the end, and a plastic spray was applied over the ends—all, of course, for the purpose of keeping water out of the hollow sections.

Spreader Mounting

The next big job was the spreader supports. Each of the two end supports required the following:

- 1 — 61 ST aluminum solid round 5 inches in diameter, $2\frac{1}{2}$ inches thick
- 5 — 61 ST aluminum tubing $1\frac{1}{4}$ inches diameter, 0.083-inch wall, 12 inches long.

Four holes $1\frac{1}{4}$ inches in diameter by $1\frac{1}{2}$ inches deep, spaced 90 degrees, were bored into the perimeter of the solid round aluminum piece. (See Fig. 1A). Another hole $1\frac{1}{4}$ inches in diameter was bored all the way through the center of the aluminum round. (See Fig. 1B). The five 12-inch lengths of $1\frac{1}{4}$ -inch tubing were inserted into these holes and welded to the aluminum round. At this point I had a component comparable to a wheel of a car with a hub, axle, and four spokes radiating at 90-degree intervals.

The next problem was how to insert the $1\frac{1}{4}$ -inch tubing (the spokes) into the $1\frac{1}{4}$ -inch i.d. Fiberglas, especially since the inside diameter of the Fiberglas was tapered. This was solved by cutting slits in the ends of each spoke. These slits were cut down the length of the tubing to a point about $1\frac{1}{2}$ inches from the hub. This was done so that as the Fiberglas pole was slipped over the spokes, the slits would allow the spokes to compress and follow the inside taper of the Fiberglas poles.

When the butt of the Fiberglas pole reached the unslit portion of the spoke, the joint began to lock, and by turning the pole as it was pushed onto the tubing, it "froze" into place flush against the hub and actually held without any additional work. To make sure, however, a hose clamp was put around the Fiberglas pole near the point where it butted against the hub.

Quad Loops

The quad loops were made of No. 14 soft-drawn copper wire. To assure proper dimensions,

the four sides were measured off (11 feet $3\frac{1}{2}$ inches for 15 meters and 8 feet $4\frac{1}{2}$ inches for 10 meters) and a loop of wire was soldered to each of the four corners. Hose clamps were slipped over the spreaders and the clamping bolts were passed through the loops. The clamps were then adjusted on the spreaders so that the wires between were taut, with the spreaders slightly bowed. The reflector elements are duplicates of the driven elements, except that transmission-line spacers are used to tie the ends of the elements together.

The reflector stubs were made of $\frac{1}{8}$ -inch copper rod. Originally, Copperweld wire was used but could not be straightened satisfactorily, and soft-drawn copper wire bends too easily. The weight of the copper rods is not enough to cause the element wires to sag noticeably. The shorting bars consist of two alligator clips with a short piece of No. 12 wire soldered between them to give a spread of $3\frac{1}{2}$ inches, which equals the length of the spacing insulator.

The Boom

The last step was to join the axle to the boom. For the boom an 8-foot length of 61 ST 1.5 inches o.d. \times 0.083-inch wall was used. Therefore, the i.d. of the boom was 1.334 inches and, since the o.d. of the axle was 1.25 inches, there was a play between the two of 0.084 inch. Fortunately, I was able to obtain some plastic sleeving with an i.d. of 1.25 inches and a 0.04-inch wall. By slipping this plastic sleeve over the 1.25-inch axle, it increased the o.d. to 1.33 inches, which made it just 0.004 inch less than the i.d. of the boom. The result was a very tight fit between the axle and the boom, eliminating all play between the two. Since aluminum against aluminum will eventually form a weld, the plastic sleeve enables me to remove the boom if it ever becomes necessary.

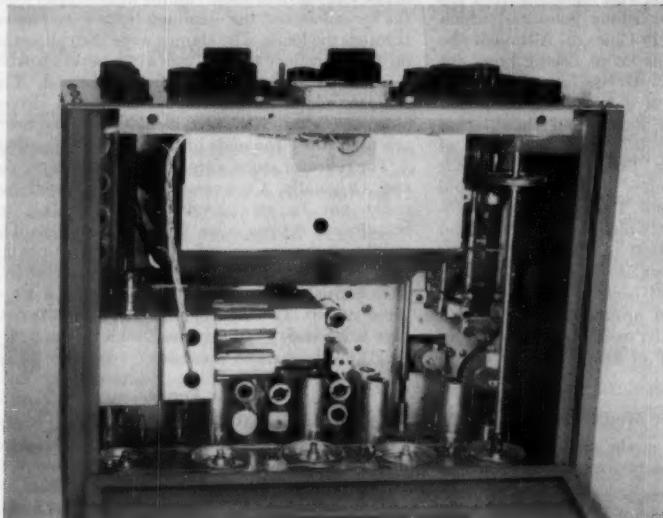
Two holes were drilled at right angles to each other through the boom and axle, and $\frac{1}{4}$ -inch bolts were used to lock the axle and boom together. The total weight, boom included, is approximately 22 pounds.

Adjustment

The dimensions of the elements were selected from the *ARRL Antenna Book* and previous articles in *QST* and other publications. These dimensions were also checked out with the formula 238/Mc. When the antenna was at the 25-foot height before the tower was cranked up, the grid-dip meter showed that the 15-meter antenna resonated at 21.0 Mc. However, when the transmission line was attached and the transmitter turned on, the s.w.r. at 21.450 was 1.75 to 1, and went higher as the frequency was decreased. After much cut and try, a 14-inch stub was added to the 15-meter driven element. After adjusting the shorting bar, an s.w.r. of slightly less than 1.1:1 and a f/b of 28 db. were obtained. This adjustment, however, did not give maximum gain. When adjustment was made for maximum gain it was found that the s.w.r. ran from 1.3:1 at 21.250 Mc. to 1.04:1 at

(Continued on page 156)

• Recent Equipment —



In this "top view" the 6146 output stage is at the lower right, and the associated all-band tank capacitor is just above it. The five pulleys wired together control the five band switches that are visible in another photo. The large shield at the top center covers the two three-gang tuning capacitors.

Cosmophone 35 Bilateral Transceiver

AS IF ham radio isn't complicated enough these days, Cosmos Industries has to come along and offer a "bilateral transceiver", of all things. However, if you can get over the shock of a transceiver being bilateral and dig into the thing a little, you find that a mighty interesting piece of gear hides behind the ponderous title.

Essentially the Cosmophone 35 is a single-sideband station in one package, with the necessary power supply in another case. It is apparently designed for home-station use, and its case dimensions (r.f. package) of 17 inches wide, 12 inches high and 15 inches deep would seem to eliminate its adaptation to mobile work by all but a few members of the station-wagon set. But calling it a "station" is no idle phrase; the 35 is truly a station, since it is capable of completely divorcing the receiver and transmitter tuning functions, or combining them in one control if desired.

Look at it this way. There are two tuning dials on the 35, marked A and B. Each one has its own pointer on the slide-rule dial scale. A four-position switch on the panel is marked RA-TA, RA-TB, RB-TA and RB-TB. Think "receive" for R and "transmit" for T, and you see that this switch sets you up for the four possible modes of operation. For example, on RA-TA you receive and transmit on the frequency, controlled by the setting of knob A. On RA-TB you receive on the frequency set by knob A and transmit on the frequency set by knob B. It takes longer to explain than it does to understand with the unit

in front of you. The possibilities should be obvious. You can tune into a net with the A dial and the switch set on RA-TA, and you can also be set up on another net by switching to RB-TB for a few seconds. This way you can hop back and forth if desired. Or you may want to work DX outside of your own frequency assignment, in which case you would use the RA-TB or RB-TA setting. You can check on the QRM level of your transmitter frequency without detuning from the DX station's channel. It's like having two transmitters and two receivers. Those are only the very obvious tricks; there will undoubtedly be many more developed as the units get into the hands of the real "operators." The fact that the 35 also has provision for c.w. and "a.m." operation merely extends the tactics to those fields as well. (The a.m. provision is carrier plus one sideband, for reasons that will be obvious later on.)

Receiver

A block diagram of the receiver section is shown in Fig. 1. The receiver is a double-conversion deal with a crystal-controlled first oscillator and a tunable second oscillator. This second oscillator has two separate tuned circuits, the ones controlled by the panel knobs A and B. Which one is active at any instant depends, of course, upon the setting of the four-position switch mentioned earlier. The output of the second mixer is at 455 kc., and it passes through an i.f. amplifier

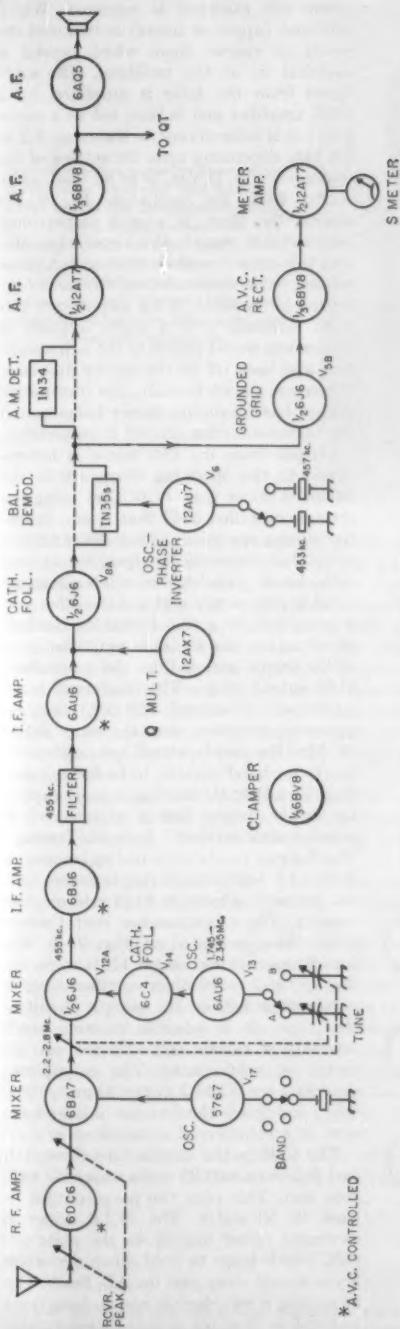


Fig. 1—Block diagram of the Cosmophone 35 during reception.

and a 3-ke. wide mechanical filter on its way to a balanced demodulator (1N35s) for c.w. or s.s.b. reception or a diode (1N34) for a.m. Selectivity in addition to that provided by the mechanical filter is supplied by a *Q* multiplier that can be used in either a notch or peak condition. The b.f.o., V_6 , is crystal-controlled because its frequency must be accurately placed and maintained on one side or the other of the filter passband. Following detection the audio signal is amplified by two triode stages before passing on to the 6AQ5 output stage.

Prior to detection the signal is sampled and passed through a grounded-grid stage and then to an a.v.c. rectifier (6BV8 diode). A.v.c. as well as manual gain is applied to the r.f. amplifier and two i.f. amplifier stages. The a.v.c. line is metered to provide an S-meter indication. The 6BV8 diode marked "Clamper" is a biased diode that during reception limits the a.v.c. control voltage to a maximum of about -20 volts. During transmission the a.v.c. bus is held at -150 volts, for receiver protection. The clamper tube helps to speed recovery of the receiver after transmission, by quickly pulling the a.v.c. line down to -20 volts, where it can rapidly arrive at the operating condition.

While you still have one of your little blue peepers on Fig. 1, this might be a good time to discuss panel controls directly associated with the receiver. The two main tuning controls have already been mentioned, although it wasn't brought out that these are delightful two-speed planetary controls that allow you to hurry across the band or to sneak up on a signal. The fast tuning corresponds to a rate of 60 ke./revolution, and the slow speed is 12 ke./revolution. These tuning controls handle three-gang capacitors that tune the oscillator and two tuned circuits between the two mixers. A panel control marked "Recv Peak" tunes the front end, as indicated in Fig. 1, and a "Recv Ant Trim" in the 6DC6 grid circuit compensates for any reactance introduced by the antenna. The *Q* Multiplier and manual gain controls have already been implied. The selection of the b.f.o. crystal at V_6 depends upon which sideband is being transmitted, as will be mentioned again later.

Transmitter

A block diagram of the Cosmos 35 in the transmit condition is shown in Fig. 2. Tubes that are active during reception as well are marked with the manufacturer's designation; e.g., tunable oscillator V_6 is used during both transmit and receive. In some cases one section of a tube is used during transmit and the other section is used during receive.

Following a 6AU6 speech amplifier, a 6J6 triode section drives the 1N35s in a balanced-modulator circuit. This balanced modulator and the 12AU7 oscillator, V_6 , were used as the demodulator and b.f.o. during reception. The double-sideband signal is fed to a grounded-grid stage and then through the mechanical filter,

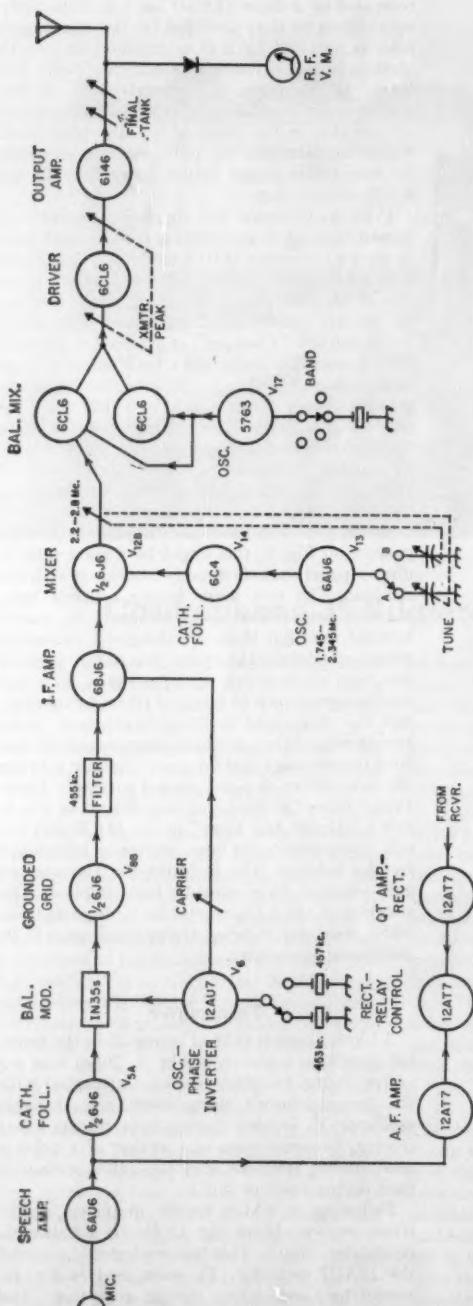


Fig. 2—Block diagram of the 35 when transmitting.

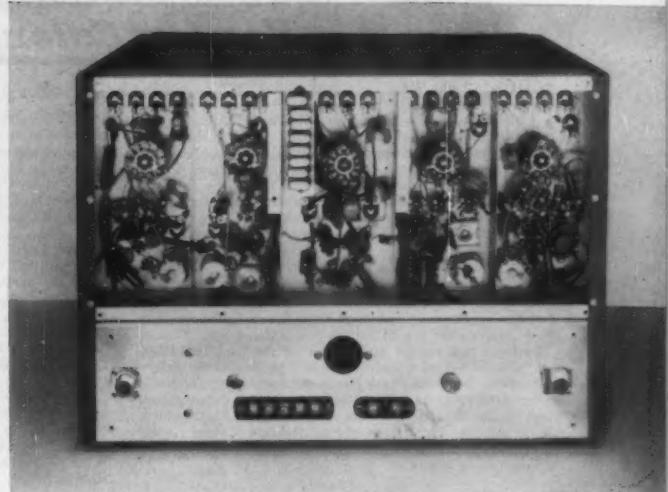
where one sideband is removed. Which sideband (upper or lower) is removed depends, of course, upon which crystal is switched in at the oscillator. The s.s.b. signal from the filter is amplified by a 6BJ6 amplifier and is then fed to a mixer where it is heterodyned to the range 2.2 to 2.8 Mc., depending upon the setting of the tuning control. If a.m. is to be used, some carrier from the oscillator, V_6 , is fed around the filter, to give a carrier-plus-one-sideband signal. C.w. operation also uses this carrier, with no sideband. A panel control (screwdriver slot) of the carrier insertion is provided; if for any reason you want sideband plus a slight amount of carrier you would switch to the a.m. condition and back off on the carrier insertion. When you switch to s.s.b., the transmitter always has maximum carrier balance, and the carrier-insertion control is inoperative.

Output from the first mixer is heterodyned to the operating frequency in the balanced mixer (pair of 6CL6s) using the crystal-controlled 5763 that is also operative during reception. This balanced mixer circuit has the oscillator signal fed to both cathodes in parallel; the sideband signal is fed to one control grid and the other grid is grounded for audio. Following the balanced mixer, the signal is amplified by a 6CL6 driver and fed to the neutralized 6146 output stage. The final tank is an "all-band" (National MB-40L) that requires no switching over the range 3.5 to 30 Mc. Its panel control has calibration marks for band centers, to facilitate resetting. To adjust the loading, a series capacitor in the output line is adjusted via a panel control marked "Antenna Tuning." The S meter can be switched to become an output r.f. voltmeter during transmit, or it can be used to indicate 6146 grid or plate current. The r.f. voltmeter isn't the obvious thing indicated in Fig. 2; it is a logarithmic device using a 1N34 to rectify the r.f. and a selenium rectifier to give compression action. By using a circuit of this type, it is possible to note small amounts of carrier and still not pin the meter on voice peaks. The circuit was described by W2ALJ in the August, 1953, *QST*, and this is the first use of it we have seen in a commercial transmitter.

The 6146 in the output runs Class AB₁ and delivers about 25 watts under the two-tone test. This puts the p.e.p. output at close to 50 watts. The 6CL6 driver is swamped rather heavily in the plate circuit, which helps to hold down distortion if you should stray past the AB₁ limits. The swamping is switched as you go from band to band, so that the gain is approximately the same on all bands. This constant gain can be appreciated by users of some other equipment.

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Rear view with a panel removed shows the receiver "front end" and the transmitter driver. The compartments, from left to right, house respectively the 6DC6 grid circuits, 6BA7 grid, 5763 and crystals, 6CL6 balanced mixer, and 6CLC-6146 coupling. The coaxial fittings are for receiver input and transmitter output; the other jacks are for key and microphone.



The VOX and anti-trip circuits are usual, and panel controls are included for setting the gains through the two channels. A total of six relays in the Cosmos 35 handles the various switching functions; three relays are associated with the transfer of d.c. and bias circuits for the send-receive cycles, and three relays are associated with the transfer of tuned circuits in the variable-oscillator and 2.2-2.8 Mc. string. These latter relays are inoperative when transceiving; they come into play if an RA-TB or RB-TA combination is used.

C.w. operation is obtained through carrier insertion and no audio; grid-block keying is used on the 6BJ6, V_{12B}, the 6CL6 driver and the 6146 output stage.

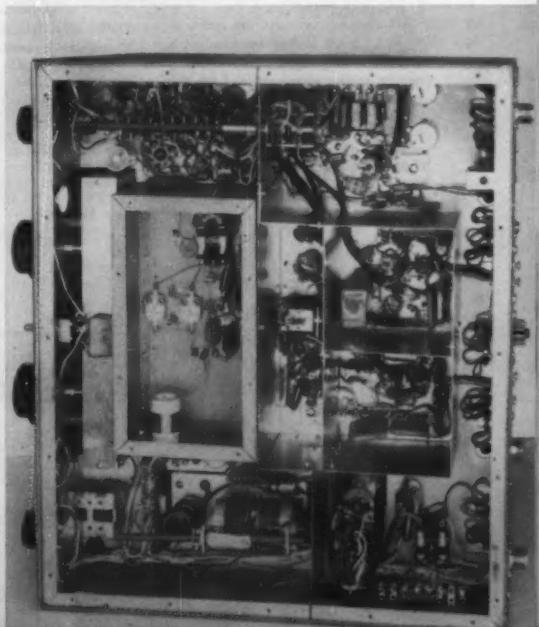
External connections at the top of the unit provide terminals for a loudspeaker, auxiliary audio input and output terminals, and -150 volts during receive, to be applied to a following linear amplifier when one is used. Separate antenna connectors for receiver and transmitter are provided, and one might think at first glance that the omission of an antenna relay is an oversight. To the contrary, the omission apparently was to simplify the addition of a following linear amplifier; when using the Cosmophone 35 "barefoot" the antenna relay can be mounted right on the back of the unit.

The power supply, a separate unit, uses a 5R4GY rectifier in a +600-volt supply, a 5U4GB

for +300 volts and OB2-OB2 stabilized +210, and a 6X5 in a OA2-stabilized -108 volts.

We can't tell you anything about the instruction book for the Cosmophone 35 because one wasn't available at the time of writing. However, you shouldn't need one unless something goes wrong, because the whole unit is quite straightforward and there is nothing tricky about connecting it to an antenna, a speaker and the a.c. line. Anyone who has ever operated an s.s.b. station should be able to handle the Cosmophone like Old Home Week, and even if you're a stranger to the Donald Duck stuff you can practice for a while on c.w. or a.m.

— B. G.



Some of the relays are visible when the bottom plate is removed. The rectangular compartment just left of center houses the variable oscillator coil; the relay switches it from one tuning capacitor to another. Audio circuits are at the upper left.

Hamfest Calendar

California — The second annual Hamfest Picnic, sponsored by the San Fernando Valley RC, will be held June 8 at the Victory-Van Owen Park, across the wash from the Naval Armory (same location as last year). There will be rigs on two, six and ten to guide you in. Free coffee, soft drinks, ice cream and candy, games and prizes for all age groups. Registration starts at 1030. Advance tickets \$1.50, at the gate \$1.75. Swap shop. Bring your own lunch. For further info contact Vic Levine, K6OKT, 6455 Bee Ave., North Hollywood, phone PO 1-9739.

Georgia — The Atlanta Radio Club will hold its annual hamfest on Sunday, June 8, at the Mickey Cochran American Legion Post No. 216, 1250 Watts Road NW, Atlanta. This location is west of Atlanta, just off the Bankhead Highway. There will be transmitter hunts on 10 and 75 meters, a get-together of the Peach Net, a chicken dinner, and many other activities. In addition there will be a dutch supper and dance Saturday evening. Tickets are \$2.00 adults, \$1.25 children. For tickets and information contact George E. Hunt jr., K4DOW, 1754 Clifton Way, SE, Atlanta 16. Phone Drake 7-0912.

Illinois — Starved Rock RC Hamfest, June 8 at the La Salle County 4-H Home and Picnic area southwest of Ottawa, on Illinois State Route 71 (same place as last year). Follow Route 23 to south end of Illinois River bridge, turn west on Rte. 71. Follow big yellow hamfest signs. Plenty of parking area and adequate facilities for all. Free swap section. Advance registrations \$1.00 if received prior May 30, otherwise \$1.50. The hamfest site is within a short driving distance of Starved Rock State Park and recreation areas. An all-day affair for Midwest hams and their families. Contact Starved Rock Radio Club, RFD #1, Box 171, Oglesby.

Iowa — The Iowa 160-meter hamfest will be held at Morris Lake near Clarion on June 8. Everyone invited. No charge. For further info contact G. D. Warland, K0AHZ, 1117 Walnut St., Webster City.

Kansas — The Central Kansas Radio Club will sponsor its 10th annual hamfest in Salina at Kenwood Park on June 8. Registration \$1.00 per person. Each person to bring a covered dish, with free drinks supplied by the club. Entertainment for the ladies and games for the kids. Contests and prizes. Rain or shine. For further info contact Joe W. Addison, W0PKD, 908 South 11th St., Salina.

Mississippi — The Cleveland ARC will sponsor its annual hamfest picnic on June 8. Bring your own lunch, which will be spread picnic style. Free drinks. Program to be announced later. (Sorry, but we have no further info on location or whom to contact. — *Ed.*)

Missouri — The Missouri Net Hamfest will be held in Sedalia, June 8, at the Missouri State Fair Grounds. Admission \$1.00 per person, basket lunch, free hot coffee and cold soft drinks. Swap shop, events for the OM's, XYLs or YLs. Everyone welcome. For further info contact Mrs. Phyllis French, W0WIE, Rte. 4, Sedalia.

Nebraska — The Dawes County Amateur Radio Club will sponsor its annual picnic on June 1 at Chadron State

Park, 10 miles south of Chadron, on Highway 19. Signs will be posted. Mobiles can check in on 3850 with a transmitter at the park. There will be a transmitter hunt and a swap table. Each person to bring food, which will be served family style. Coffee and soft drinks furnished by the club. Rain or shine. For further info contact Mrs. Bonnie Davis, KN6JGE, 320 North Chadron Ave., Chadron.

New York — RAGS (the Radio Amateurs of Greater Syracuse) will hold their annual family picnic on Sunday, June 15, at Prant's Falls (2½ miles NNE of Pompey). Activities from 2 to 5 p.m., with the picnic scheduled for 5 p.m. until dark. Refreshments furnished. Area clubs are invited to attend. For information and tickets (sorry, prices unknown — *Ed.*) contact R. Etherington, K2EAP, 208 Fay Lane, Minas, or phone OL 6-9568.

New York — The Rome Radio Club Ham-Family Day has been scheduled for May 25 at Beck's Grove, Blossevalle, commencing at noon. Entertainment for the whole family. Registration at the gate is \$4.50. Mobiles check in with W2OFQ on 3900 kc. and 29 Mc. For further info contact Harvey Walle, K2HWS, RD #1, Blossevalle.

North Dakota — The annual North Dakota hamfest and picnic will be held at Red Willow Lake, 25 miles northwest of Cooperstown, just west of N.D. Highway 1, on June 15. (Check locally for further details — none were available at this writing.)

Ohio — The Northeastern Ohio V.H.F. 50-Mc. Group will hold its third annual picnic on June 22, at the Wadsworth Municipal Park, Wadsworth. Contests, prizes, gifts, and fun galore for the whole family. For further info contact Harry E. Powell, W8PXX, Route 2, Alliance.

Pennsylvania — The Ninth Annual Gabfest of the Uniontown ARC will be held on Saturday June 21, at the club house on the old Pittsburgh Road, just off Route 51, two miles north of Uniontown. The program will include contests, prizes, horseshoes and movies. Refreshments available. W3PIE will be on 10 meters. Registration is \$2.00. This affair is stag. For further info contact the Uniontown ARC at P. O. Box 844, Uniontown.

Saskatchewan — The Saskatoon ARC is sponsoring this year's Saskatchewan hamfest, which will be held on June 29-July 1. For details contact Don Hunter, VE5HQ, 927 Avenue N. South, Saskatoon.

Vermont — The annual Burlington Amateur Radio Club International Field Day will be held at "Clarey's Bayside," Malletta Bay, on June 15. Treasure hunts on 75, 10 and 2 meters. Auction, boat rides, swimming, etc. For further info and motel, cabin or hotel reservations write to John Mansfield, W1OJO, P. O. Box 6, Winooski.

Washington — The Fourth Annual Family Picnic of the "Royal Order of Hoot Owls" will be held on Sunday, June 15, at Gaffney's Lake Wilderness Resort in Maple Valley, 16 miles east of Seattle. Open to ROHO membership only. Games and prizes. Hat contest for XYLs. Pot luck dinner at 1300. A station at the resort will be on 50.4 Mc.

• Strays •

W2MTD sent us part of a recent contract negotiated between the American-Bosch Arma Corp. and the Engineers Ass'n of Arma local 418 IUE, AFL-CIO, which provides that one of the

fringe benefits furnished by the company shall be the cost of League membership. Having helped to negotiate the contract, W2MTD is now engaged in signing up as many members as possible.

24th ARRL Sweepstakes Results

Part II—Phone and Club Totals

IF YOU'RE one of the multitude who imbibed W1ZDP's 12-page c.w. compendium (May *QST*), you know the 1957 Sweepstakes was the greatest! Phone-wise alone, entries leaped ahead 18.7 per cent to 623 logs. Keen interest is evident in the number of very high scores, the number of scores over 50,000, the many contestants who worked all sections and the intense club competition. It was a big year for the vocalist. See if you don't agree!

Up 47 per cent was the number of scores over the 100-K mark (shown in *italics*), with a whooping 60 per cent rise in those reaching 50,000: *W1s* *Ban* *BFB* *DDD* *DXS* *EKO* *EOR* *FYF* *FZ* *GFH* *JLN* *JNX* *OGU* *PKV* *QIB* *YUW* *ZVG* *7*, *W2s* *VCZ* *VDX*, *K2s* *BHP* *MPB* *SGO* *TCD* *2*, *W3s* *DHM* *FEP* *MDE* *MSK* *PQT* *WQW* *YBI* *ZIH*, *W4s* *EDQ* *FGH* *GYX* *KH6* *HKJ* *KZF* *UVJ*, *K4s* *BCN* *BZJ* *CTU* *HUU* *KBA*, *W5s* *DQK* *HMU* *IWL* *KC* *MYI* *NXF* *PSR* *VU*, *K5s* *EDM* *HEW* *IAX* *IIN*, *W6s* *AMH* *BSY* *CBE* *EIG* *GTG* *IIM* *PQW* *QIV* *ZTY* *ZZC*, *K6s* *BWD* *EVR* *ICS* *INU* *IUL* *JKQ* *LOM* *OOW* *YQC*, *W7s* *BJV* *BLX* *BSW* *CAF* *CBP* *CTZ* *FIN* *NPV* *OVA* *ZCA* *ZJW*, *W8s* *AJW* *SSA* *VOW*, *K8s* *ZEK* *CPM*, *W9s* *AIU* *FVU* *HIM* *KMN* *NZM* *OHO* *PQA* *QAX* *QXO* *YOX*, *K9s* *ALP* *ATZ* *CLO* *EED*, *W0s* *DGG* *EDX* *JEE* *PRZ* *VQC* *WVO* *YQ*, *VEs* *4KX* *5ZM*.

Among the fellows who talked up five hundred or more throat-taxing QSOs were: W0EDX 854, K6EVR 816, W6PQW 815, W3WQW 740, W1YWU 714, K4CTU 700, W5DQK 700, W9YQ 667, W9PRZ 650, W7CAF 645, W7BSW 608, W6BSY 600, K6BWD 600, W5MYI 594, W7-CBP 581, W2VCZ 570, W6CBE 560, W8AJW

WØEDX, unqualified champ of this portion of the SS, got to the summit scoring 186,880 points, picking up the Minnesota sheepskin on the way. Inside Al's modern shack is a Pacemaker driving a Viking Kilowatt Amplifier on a.m. and sideband. The receiver is a considerably rebuilt 75A1 with over 30 tube functions, all within the receiver cabinet. The knob to the left of the receiver selects individual antenna systems, permits complete band change in less than 30 seconds. The

560, W7BJV 558, W7NPV 532, W6IIM 529, W1EOR 524, W4FGH 524, W7BLX 524, W9-OHO 521, W5NXF 519, W5VU 517, W0VQC 514, W9NZM 506, K5HEW 505, K9CLO 503. Noteworthy again this year is W6PQW's third-ranking contact figure, reflecting what low-power, perseverance and fortitude can do in a single-band stint on 28 Mc.

Multipliers are the thing, as any good contest man knows, and the following group snagged all 73 with all but three operators doing it the low-power way: W1s BAN FZ YWU, W2VCZ, W3MSK, W5DQK, W6CBE, K6LOM, W7BSW, W8AJW, K8AEK, W9s EDX PRZ. Almost in league with this select clientele with 72 to their credit were: W1EOR, W6ZZC, K6BWD, W8NZM, K9ALP.

So each of you can see how your score shapes up with the high man in your vicinity, here are the licensing area leaders:

W1YWU	156,366	W0EDX	186,880
W2VCZ	124,830	VE2KG	6,138
W3MSK	104,244	VE3DYB	34,602
K4CTU	93,130	VE4KX	51,072
W5DQK	152,643	VE5ZM	66,294
W6PQW	147,864	VE6WW	20,405
W7BSW	133,152	VE7ZM	44,781
W8AJW	121,764	VE8OW	275
W9OHO	106,812		

Club Scores

A mighty effort on behalf of the Frankford Radio Club snapped a 7-year winning streak of the Potomac Valley Radio Club, second this time. The FRC crew really worked for their engraved silver-handed gavel, with over 50 percent of their entries topping the one-hundred thousand mark. With an aggregate score of just under the 5-million peak, the summit scoring 186,880 points, picking up the Minnesota award for driving a Viking Kilowatt Amplifier on a.m. and sideband functions, all within the receiver cabinet. The knob to permits complete band change in less than 30 seconds. The exterior "landscaping"—beams, a vertical, several horizontals, etc.—would gladden the heart of any ham. Note that pole that supports the beams. It weigh three



the Frankford fellows have set a rugged pace for future SS club competitions.

PVRC upped their 1956 total by almost a half-million points, averaging out to about 85,000 points per contestant. Pretty nifty doings with 51 participants!

For the first time, the El-Ray Radio Club of Massachusetts joined the big three. After 4 years in 4th place, the

El-Ray boys may prove pretty tough to dislodge from their newly won third position. The Milwaukee Radio Amateurs' Club made a special effort to climb toward the top and rose from 8th to 4th. The Hamfesters Radio Club of Chicago reported that 30 per cent of the club membership took part. Results are apparent in their climb from 20th to 5th! The Westside Amateur Radio Club of New Orleans rose from

PHONE WINNERS, 24TH A.R.R.L. SWEEPSTAKES CONTEST

Section	Call	Score	Transmitting Equipment	Receiving Equipment	Bands Used
E. Penna.	W3MDE	84,000	VFO-6L6-807-811	GPR90	40, 20, 15, 10, 6
Md.-Del.-D. C.	W3MSK	104,244	32V1	75A3	75, 40, 20, 15, 10, 2
S. N. J.	K2CMB	84,150	DX100	75A4	75, 40, 15, 10
W. N. Y.	K2BHP	102,900	DX100	NC183D	75, 40, 15, 10
W. Penna.	W3ABW	39,407	DX100	HQ140X	40, 20, 15, 10
Illinois	W9OHO	106,812	DX100	SX100	75, 40, 13
Indiana	K9CLO	71,426	VFO-6AQ5e-2E26-4-250A	HRO7	75, 40, 20, 15
Wisconsin	W9PQA	83,232	Viking II	NC37B	75, 40, 20, 15, 10
No. Dakota	W9KZZ	49,860	Viking II	S76	75, 40, 20, 15, 10
So. Dakota	W9VQ	105,053	32V2	75A1	75, 40, 20, 15, 10
Minnesota	W9EDX	186,880	Viking Pacemaker KW	75A1 (modified)	75, 40, 20, 15, 10
Arkansas	K5IAK	57,675	DX100	HQ140X	40, 15
Louisiana	W5KC	83,817	32V3	HRO7	75, 40, 20, 15, 10
Mississippi	W5DQK	152,643	5100	75A3	75, 40, 20, 15, 10
Tennessee	W4IGW	29,917	DX100	SX42	40, 20, 15, 10
Kentucky	W4KZF	60,481	Ranger	NC300	75, 40, 20, 15, 10
Michigan	K8CPM	52,470	Valiant	RME 4300, DB23	40, 20, 15, 10
Ohio	W8AJW	121,764	32V1; Communicator	HQ120X; Communicator	75, 40, 20, 15, 11, 10, 6
E. N. Y.	K2TCD/2	95,220	Valiant	HQ140X, DB23	75, 40, 20, 15, 10
N. Y. C.-L. I.	K2SGO	58,500	DX100	NC98	40, 20, 15, 10
N. N. J.	W2VCZ	124,830	Ranger; Viking I	NC300	75, 40, 20, 15, 10
Iowa	W9UDO	33,981	5100B	75A4	40, 10
Kansas	W9QMS	49,680	Viking II	75A4	40, 10
Missouri	W6JEE	82,877	Viking II	75A2	40, 20, 15, 10
Nebraska	K9DLL	48,018	DX100	NC300	75, 40, 20, 15, 10
Connecticut	W1YWU	166,366	VFO-Viking I (modified)	75A2; Communicator	160, 75, 40, 20, 15, 11, 10, 2
Maine	W1UOT	27,804	VFO-6AU6-8AQ5-1625s	HQ129X	75, 40, 15
E. Mass.	W1OGU	77,880	VFO-6L6-807-8005s	HRO5	75, 40, 20, 10
W. Mass.	W1EKO	90,825	32V2; Communicator	NC183; Communicator	75, 40, 20, 15, 11, 10, 6
N. H.	W1FZ	102,711	VFO-Viking I	75A4	75, 40, 20, 15, 10, 6
R. I.	W1FBF	76,527	Ranger-813	75A1	75, 40, 20, 15, 10
Vermont	WTKON/1	1767	Ranger	HQ129X; SX 88	75, 40, 20, 15, 2
Alaska	KL7AWR	27,884	Ranger-Viking KW	75A1	75, 20, 10
Idaho	W7CTZ	56,303	PP 810s	SX100	75, 40, 15, 10
Montana	WTBJV	105,216	Ranger	75A1	75, 40, 15, 10
Oregon	W7OVA	59,400	Viking I	NC300	75, 40, 20, 15, 10
Washington	WTBSW	133,152	Valiant	SX71	20, 15, 10
Hawaii	W4GYX/KH6	64,142	5100	SX28	40, 15, 10
Nevada	W7ZCA	93,000	DX100	HRO60	75, 40, 20, 15, 10
Santa Clara V.	W6CBE	81,760	Parallel 1-125As	75A4	10
East Bay	W6PQW	147,864	VFO-6L6-2E26-24Gs	NC101X	10
San Francisco	K6HIP	27,735	6AG7-6AG7-6146	Super Pro, HF10-20	40, 20, 15, 10
Sacramento V.	W6QIV	89,094	VFO-12BY7-12BY7-6146-813	Super Pro	40, 15, 10
San Joaquin V.	W6ZQV	92,664	DX100	S76	75, 20, 10
No. Carolina	K4KBA	88,128	DX100; Viking II	75A2	75, 40, 15, 10
So. Carolina	W4EDQ	53,550	Valiant	HQ140X, DB23	75, 40, 20, 10
Virginia	K4HUU	59,109	DX100	75A4	75, 40, 20, 15, 10
W. Virginia	W8SSA	65,070	DX100	SX32	40, 20, 15, 10
Colorado	W8DGG	59,396	6AG7-6V6-1625s	SX100	15
Utah	WTZOR	1242	Ranger	SX28	40, 20, 15, 10
New Mexico	W5MYI	121,095	DX100	SX28	40, 20, 15, 10
Alabama	K4LNQ	41,925	DX100	SX99	75, 40, 20, 15, 10
E. Florida	K4CTU	93,130	Viking 500	SX101	40, 20, 15, 10
W. Florida	W5BZJ/4	18,360	6AG7-6AG7-1625s	NC98	40, 20, 10
Georgia	W4FGH	71,264	250THs; S13	HQ129X; SX28	40, 20, 15, 10
West Indies	CO3HD	12,226	S13	SX28	20, 15
Canal Zone	K251F	288	6V6-6146-250TH	S76	20
Los Angeles	K6EVK	170,520	Viking II	75A1; 75A3	40, 20, 15, 10
Arizona	W7CAF	121,440	DX100	NC88	75, 40, 20, 15, 10
San Diego	K6YQC	58,116	Viking I	HQ100	40, 15, 10
Santa Barbara	W6NTF	37,044	DX100; Communicator	NC183D; Communicator	75, 40, 20, 15, 11, 10, 2
No. Texas	W5VU	108,570	32V3	75A3	40, 20, 15, 10
Oklahoma	W5IWL	60,060	VFO-5763-5763-6146-813	NC300	75, 40, 20, 15, 10
So. Texas	K5EDM	67,045	DX100	SX100	40, 20, 15, 10
Quebec	VE2KG	6138	VFO-6V6-807	Marconi R1155	10
Ontario	VE3DVB	34,692	VFO-Viking II	HRO80T	40, 20, 15, 10
Manitoba	VE4KX	51,072	32V3	NC300	20, 15, 10
Sask.	VE5ZM	66,294	TBS80D	SC77A	20, 15, 10
Alberta	VE6WW	20,405	DX100	HQ129X	75, 40, 20, 15, 10
B. C.	VE7ZM	44,781	Viking II	75A4	40, 20, 15, 10
N. W. T.	VE80W	275	32V3	51J3	15, 10

Inside or out, North Texan W5VU's setup is a beauty. In use during the contest was the versatile 32V3-75A3 combination while 3 and 4 element beams (over 75 feet high) handled the rest.

54th to 35th place and reported they all had fun and that the perennial cry of "wait till next year" was again heard on all sides.

Contest Quotes

"Thought I missed my modest goal of 25,000 points, but after the smoke cleared away I realized I had a 1.5 multiplier so I have 29,000 to beat next year." — *W3IBX*. . . . "Surprised myself by just missing 4 sections." — *K6JCS*. . . . "Wouldn't it be nice if every contestant would check his clock against WWV just before the start of the SS?" — *W2MQB*. . . . "Good conditions both weekends." — *W3BPW*. . . . "Special thanks to W6ERB and W7WNI for my 72nd and 73rd multiplier!" — *W1YWU*. . . . "Didn't hear W3VKD this year, what happened?" — *W3ABW* (Note: He was on c.w.). . . . "By the way, where was Utah?" — *K1BEB*. . . . "VE1ZE sounded like music from heaven when he answered me for Maritime, my 73rd section." — *W5DQK*. . . . "Operating this 4-ring circus at the Egyptian Radio Club isn't all it's cracked up to be." — *K9HEM*, opr. of *W9AIU*. . . . "I was really enjoying the contest until about three a.m. of the second week end when another North Carolina station gave me a number which was 120 more than mine. This is pretty hard to take at that time of themoring!" — *K4BZJ*. . . . "Local QRN on 75 and 40 made operating on these bands extremely difficult." — *W0NZM*. . . . "The contest sparked a new spirit of enthusiasm for the club members of Northeastern University." — *W1KBN*. . . . "Worked W8VQC who used to be W9VQC." — *W2VQC*. . . . "Noted that a lot of the old regulars seemed to be absent this year. Maybe we are due for some new champions." — *W5IW*. . . . "FB Sweepstakes, I wore out the transmit switch in the middle of my 424th QSO!" — *W1DXS*. . . . "Funnest QSO was with a K6 who got so excited when he found out I was in West Virginia that he forgot my call, stumbled over his own call and failed to give me a signal report. It seemed I was the first W. Va. station he had ever heard, his last state was WAS, and his 73rd section for the contest!" — *W8SSA*. . . . "Sorry I couldn't be called and hope to see everyone next year." — *K6JQR*, opr. of *KL7AWR*. . . . "I was so anxious to make it 5 consecutive years for Oregon and then I completely forgot the first week end!" — *W7OVA* (He did it anyway!). . . . "Ten meters came through as it has a habit of doing. Wonderful cooperation from the gang on this band." — *W6PQW*. . . . "Last section was raised on a CQ Vermont, sheer operating genius! And then there are these characters who respond to a QRZ by giving your call ten times and signing theirs once, and without benefit of phonetics." — *W6AJW*. . . . "Heard Wyoming the first week end, but thought I'd catch on the second week end when they weren't so busy. My mistake." — *W5NXF*. . . . "Got my Valiant the day before the second week end. Two minutes before SS time, the high voltage rectifier blew. At 6 o'clock, I sat down and cried. It really happens in the SS!" — *K2ZAU*. . . . "It was my first SS and I could write a book about all the things that went wrong." — *K2TSW*. . . . "Worked every section I heard



except one, which was a VE8 on 20. 50 watts doesn't go far on that band!" — *K4BCN*. . . . "My 220 contacts in 57 sections (and 46 states) prove that NBFM isn't dead yet." — *K2IVB*. . . . "A swell contest at this QTH and I was certainly thrilled to have worked all 73." — *W2VCZ*. . . . "Worked Montana for my 47th state." — *K2SYB*.

Before you get too far into the following tabulation, why not mark the two week ends preceding Thanksgiving for your attention and participation in the 25th SS. The silver anniversary of the Sweepstakes is sure to be stupendous!

— E. W.

PHONE SCORES

Twenty-Fourth Sweepstakes Contest

Scores are grouped by Divisions and Sections. . . . The operator of the station first-listed in each Section is award winner for that Section unless otherwise indicated. . . . Likewise the "power factor" used in computing points in each score is indicated by the letter A or B. . . . A indicates power up to and including 150 watts (multiplier of 1.5, phone). B over 150 watts (multiplier of 1). . . . The total operating time to the nearest hour, when given for each station, is the last figure following the score. . . . Example of listings: W3MDE . . . 84,000-400-70-A-30, or, final score 84,000, number of stations 400, number of sections 70, power factor of 1.5, total operating time 30 hours. . . . Multioperator stations are grouped in order of score following single-operator station listings in each section tabulation.

ATLANTIC DIVISION

Eastern Pennsylvania

W3MDE	84,000-400-70-A-30	W3YLL	72- 6- 4-A- 1
W3YBL	66,240-320-69-A-37	W3WBS	48- 4- 4-A- 1
W3VW	57,024-352-54-A-13	W3EQA	45- 15- 1-A- 1
W3ZIIH	57,024-352-54-A-13	W3BUR	36- 4- 3-A- 1
W3TRU	38,979-213-61-A-7	W3EBG	21- 7- 1-A- 1
W3MQC	28,290-205-46-A-19	W3GRS	21- 7- 1-A- 1
W3HDI	28,152-190-51-A-13	W3ALB	18- 6- 6-A- 1
W3WQF	23,004-142-54-A-28	W3UBO	12- 2- 2-A- 2
W3YHU	20,100-142-54-A-19	W3YWW	3- 1- 1-A- 1
W3PQH	19,000-190-51-A-13		
W3QEZ	17,286-134-43-A-24		
W3RAE	12,488-135-37-A-28		
K3ALU	12,144-92-44-A-16		
W3PNL	6975-76-31-A-7	W3PQT	376-414-47-H-10
W3GHU	11,340-134-35-A-19	W3KDP	33,330-253-66-A-22
W3W	6700-69-A-1	W3BFW	32,916-213-52-A-22
W3TMN	4,929-32-31-A-8	W3IBX	29,205-177-55-A-22
W3DJL	4,536-54-28-A-7	W3JPT	27,612-156-59-A-31
W3VTR	3,000-40-25-A- -	W3PKC	12,000-125-48-H-20
W3CNO	2,457-37-21-A- -	W3SOP	9,900-85-48-H-12
W3WV	2,227-31-16-A-12	W3MCG	1485-31-16-A-4
W3ZJD	1,281-31-16-A-12	W3GRF	36- 9- 2-A- 2
W3HIO	975-33-10-A-13		
W3FWC	792-22-12-A- 5		
K3ALD	726-22-11-A-12		
W3DQQ	378-14- 9-A- 1		
W3AAU	273-13- 7-A- 5		
W3VQ	168-14- 4-A- 22		
W3BRW	168-14- 4-A- 22		
W3EAN	108- 6- 6-A- 1		

Md.-Del.-D. C.

W3MSK	104,244-478-73-A-40
W3WQW	97,152-740-66-H-40
W3W	56,000-190-51-A-10
W3PQH	376-414-47-H-10
W3GRS	33,330-253-66-A-22
W3ALB	32,916-213-52-A-22
W3IBX	29,205-177-55-A-22
W3JPT	27,612-156-59-A-31
W3PKC	12,000-125-48-H-20
W3SOP	9,900-85-48-H-12
W3MCG	1485-31-16-A-4
W3GRF	36- 9- 2-A- 2

Southern New Jersey

K2MPB	84,150-428-66-A-39
W2QKZ	46,215-237-65-A-26
W2B	42,570-211-65-H-24
W2W	39,000-190-51-A-22
K2BQW	20,458-193-53-H-40
K2ARY	18,868-178-53-H-31



W2WE.....13,500-138-50-B-17
 K2EY.....3978-51-26-A-23
 K2SVL.....3564-50-24-A-3
 K2AFW.....3384-47-24-A-12
 W2ADA.....1300-50-23-B-5
 K2JGU.....384-16-8-A-1

Western New York

K2BHF.....102,500-493-70-A-39
 W2VDX.....75,000-37-A-38
 K2DBB.....25,540-170-54-A-27
 W2OZU.....25,110-180-45-A-20
 W2MTA/2.....9450-91-35-A-14

Western Pennsylvania

W2COB.....8832-64-46-A-13
 W2UM.....7995-97-41-B-9
 K2BWR.....3444-41-28-A-11
 W2JFN.....2952-41-24-A-4
 K2QDT.....990-22-15-A-2

CENTRAL DIVISION

Illinois
 W9OHO.....103,812-52-69-A-40
 W9AIIU.....93,908-470-67-A-40
 W9HIM.....89,991-48-69-A-33
 W9NZM.....72,720-506-72-B-35
 W9FVU.....65,340-330-66-A-30
 W9KMN.....60,192-301-66-A-32
 W9WZU.....58,000-301-66-A-32
 K9ED.....54,000-303-60-A-34
 K9ATZ.....53,865-285-63-A-24
 W9LIG.....45,694-432-67-H-32
 K9CHU.....43,560-251-60-A-33

Wisconsin
 W9LQF.....36,234-198-61-A-20
 W9BH.....55,037-230-51-A-27
 W9WFS.....34,125-163-70-A-26
 W9PDE.....33,000-198-54-A-26
 W9PNY.....31,590-198-54-A-31
 W9NLF.....31,140-173-60-A-40
 W9PJP.....27,477-213-43-A-30
 W9PNE.....21,267-141-51-A-14
 W9KX.....19,673-153-43-A-29
 W9WFP.....16,000-141-49-A-22
 K9EDQ.....13,674-106-43-A-18
 W9GVQ.....10,098-102-33-A-16
 W9PVE.....8230-89-31-A-24
 K9AYW.....7700-110-35-B-16



CLUB SCORES

Club	Score	Valid Entries	C.W. Winner	Phone Winner
Frankford Radio Club	4,985,760	65	W3JNQ	W3MDE
Potomac Valley Radio Club	4,287,698	51	W4KFC	W3MSK
El-Ray Radio Club (Mass.)	1,447,817	44	W1CWX	W10GU
Milwaukee Radio Amateurs' Club	1,369,688	40	W9DYG	W9PQA
Hannestown Radio Club (Ill.)	972,547	50	W9IRH	W9QXO
Westpark Radios (Ohio)	971,669	32	W8VTF	W8AJW
Order of Billed Owls (N. Y.)	969,577	6	W2VFC	W2VFC
Central States Radio Club	966,205	13	W9WBL	W9FVU
Ohio Valley Amateur Radio Assn.	571,202	9	W8SDJ	W8SDJ
York Radio Club (Ill.)	522,315	3	W9YFV	W2BLV
South Jersey Radio Assn.	488,717	16	W2EXB	W2OQI
Garden State Amateur Radio Assn. (N. J.)	467,134	8	W2OIB	W2OQI
Suffolk County Radio Club (N. Y.)	464,152	14	W2PZB	W2OQI
Shore Chautauqua Radio Club (Iowa)	419,220	5	W9WZG	W9WZG
Central High School Radio Club (Iowa)	411,647	12	W8WDK	W8WDK
Tri-County Radio Assn. (N. J.)	408,124	16	W2EBG	K2EYZ
Wisconsin Valley Radio Assn.	395,357	19	W9RQM	W9JBF
Buckeye Shortwave Radio Assn. (Ohio)	387,032	10	W8OYI	W8GKB
Joliet Amateur Radio Society (Ill.)	375,530	7	W9RCJ	W2MCO
Lake Erie Radio Club (N. Y.)	371,114	11	W2VFC	W2MCO
Curry Bell Amateur Radio Club (Calif.)	367,333	7	K6GLC	W61IM
Philadelphia Wireless Assn.	362,236	10	W3HHK	W3YHU
Richmond Amateur Radio Club (Va.)	345,281	9	W4JUQ	KAHUU
Lockport Amateur Radio Assn. (N. Y.)	344,910	6	K2KCE	.....
Nassau Radio Club (N. Y.)	334,564	5	W2IVS	.....
San Antonio Radio Club	327,242	4	W6LGG	.....
Delano Amateur Radio Club (Calif.)	318,120	6	W9WYM	W9ZCZ
Central Michigan Amateur Radio Club	315,499	6	W1BHD	.....
Niagara Radio Club (N. Y.)	311,233	6	W8DJN	.....
Denver Radio Club	298,845	8	W2VJO	.....
Columbus Amateur Radio Assn. (Ohio)	285,683	6	W9AZT	K9EBV
Johnson County Radio Amateur Club (Kans.)	266,120	7	W9WVA	W8VOW
Delta Amateur Radio Club	249,000	11	K9CPB	W9QMS
Westside Amateur Radio Club (La.)	236,915	10	W5BUK	W9INL
Starved Rock Radio Club (Ill.)	254,679	14	W9ARV	W9LIG
Cuyahoga Falls Radio Club (Ohio)	253,048	4	.....	.....
Short Skip Radio Club	220,842	13	W3YLL	K2EY
Montrose County Amateur Radio Club (Colo.)	211,695	9	W9WME	.....
Narragansett Assn. of Amateur Radio Operators (R. I.)	205,455	5	W1CJH	W4LNX
Biloxi Radio Club (Va.)	200,000	6	.....	.....
Atlanta Radio Club	197,443	5	W4ZKU	.....
Bronx High School of Science Radio Club	197,264	5	K2PRP	.....
Mid-Island Radio Club (N. Y.)	196,537	5	K2PHF	.....
Syracuse V. H. F. Club	195,153	3	W2EMW	.....
Mohawk Radio Club (N. Y.)	184,700	8	W2HTH	K2AAN
University of Connecticut Amateur Radio Club	182,400	11	W1WSKA	WIYWU
Sad Sack Radio Club (Calif.)	180,466	4	.....	.....
North Penn Amateur Radio Club (Penn.)	179,929	19	W3JSA	W3JRU
Springfield Amateur Radio Club (Ohio)	169,072	7	W8LVH	W5MYI
Santa Fe Radio Club	157,389	3	K2PLF	.....
Watching Valley Radio Club (N. J.)	150,592	9	.....	.....
Frye Amateur Radio Club (Tenn.)	142,026	3	W1FRR	WIUKO
Framingham Radio Club (Mass.)	138,537	7	W1TS	W9ETV
South Lyman's Chester Propagation Society (Conn.)	137,131	4	W9ETV	W9FLN
St. Louis University Amateur Radio Club	129,048	6	.....	.....
Kankakee Area Radio Society (Ill.)	124,057	3	W8AL	W8IKM
Canton Amateur Radio Club (Ohio)	121,246	11	K6IYJ	.....
Long Beach Wireless Operators	115,223	3	W8SCD	W9KMN
Dayton Amateur Radio Assn.	112,378	7	.....	.....
Swartz Radio Club (Ill.)	111,361	5	W18WD	W1EOR
Middlebury Amateur Radio Club (Mass.)	111,119	5	W1EWF	.....
Hartford County Amateur Radio Assn.	111,279	3	.....	.....
Tri-State Radio Club (Nebr.)	108,323	3	.....	.....
Stratford Amateur Radio Club (Conn.)	97,042	8	W1GVK	.....
South Bay Amateur Radio Society (Calif.)	81,606	7	W9NAD	.....
Tri-State Amateur Radio Society (Ind.)	64,557	6	K9EYD	.....
Schenectady Amateur Radio Assn.	59,440	5	K2QIX	.....
Western Illinois Radio Club	51,145	4	.....	.....
Amateur Radio Society of C. C. N. Y.	50,213	3	.....	.....
Bayonne Civil Defense Amateur Radio Club (N. J.)	49,152	3	.....	.....
Albany Park Amateur Radio Club (Ill.)	41,308	5	K9JIN	.....
Iowa-Illinois Amateur Radio Club	26,075	3	K9AAH	.....
Lyons Township High School Radio Club (Ill.)	23,689	4	K9GAK	.....
Munford School Amateur Radio Club (Mich.)	22,344	3	K9DDU	.....
Brockton High School Radio Club (Mass.)	18,664	6	W1ETH	VE2ADD
Norquebont Amateur Radio Assn.	18,090	3	.....	.....
Port City Amateur Radio Club (N. H.)	8,102	3	.....	.....
University of Massachusetts Radio Club	5,643	3	KNICAU	.....

W8IFX, opr.

W91IDA	6400-100-32-H-12	K9ELH	11,045-100-37-A-14
W9AJL	5172-121-44-A-21	W9ZTO	9765-105-31-A-12
W9VTS	5106-73-23-A-8	W9RZD	5602-79-33-A-9
W9VQC	1158-63-22-A-8	K9CAG	5841-64-33-A-9
W9YZL	2550-51-25-B-7	W9QGR	5400-60-30-A-4
W9BUT	2496-48-26-R-13	W9AOW	4998-50-34-A-12
W9YYG	2139-31-23-A-2	W9NRP	4950-75-33-R-8
W9VAN	2112-30-23-A-4	W9BAMM	3645-45-27-A-3
W9AVH	2088-44-16-A-1	W9BAM	5045-51-27-A-3
K9EIL	2015-30-21-A-9	K9BMQ	1783-33-17-A-4
W9FDY	1890-30-21-A-6	W9LXY	1344-28-16-A-5
W9HWN	840-39-10-A-7	W9FNZ	961-20-16-A-4
K9DEN	720-24-10-A-4	W9BTM	900-25-12-A-7
W9WQO	576-27-8-A-9	W9ONY	840-24-14-A-6
K9AAR	520-27-8-A-1	W9VTR	840-24-14-A-1
K9BAD	378-14-14-B-2	W9VHA	756-23-12-A-6
W9EFH	360-15-8-A-4	W9SIE	756-18-14-A-6
W9KPK	345-12-10-A-2	W9HCX	108-6-6-A-1
W9BVY	336-14-8-A-1	K9CAN	108-9-6-R-1
K9AXD	312-14-8-A-1	W9UDK	90-8-5-A-1
W9UJA	276-11-8-A-2	W9FDX	32-4-4-B-1
W9VJN	210-11-11-A-1	K9EUE	27-3-3-A-1
K9AWK	252-14-9-B-1		
W9VAC	210-14-5-A-3		
W9RWH	160-5-4-A-1		
KL7CDF	27-9-1-A-1		
W9GMK	24-8-1-A-2		
K9VNL	18-8-1-A-3		
W9HPS	18-8-1-A-4		
K9EEC	18-6-1-A-1		
W9RIN	2-2-1-A-1		
W9ECY	3-1-1-A-1		
K9BIA	3-1-1-A-1		
K9CYU (K9E AXD CYU)	38,976-232-56-A-35		
W9MTO (W9E MTO ZAK)	226-212-62-B-24		
W9QE1 (W9E JUN QED)	18,018-226-42-A-1		
W9AWE (4 opers)	5824-104-28-B-19		
W9NXY (W9E ATU NXY)	2112-44-16-A-4		
K9CNO (K9E ARC CNO)	2025-15-15-A-13		
KN9HNH (KN1COJ)			
KN9HNH			
	27-9-1-A-4		

DAKOTA DIVISION

North Dakota

W9KZZ	.49,860-278-60-A-
K9CND	.48,144-272-59-A-32
W9WTL	.33,512-292-59-H-17
W9KLF	.14,400-125-40-A-6

South Dakota

W9EDX	.186,880-854-73-H-26
W9WVO	.50,620-384-65-H-25
W9TCF	.19,415-154-43-A-23
K9LJP	.14,932-119-42-A-23
W9CEL	.13,320-111-40-A-28
W9KBT	.11,400-100-38-A-28

DELTA DIVISION

Arkansas

K5IAK	.57,675-325-59-A-18
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This modest shack was the scene of VE5ZM's QRP conquest of Canadian honors. John's 35-watter was put to good use on 20, 15 and 10, earning him 66,294 points. Dipoles for 15 and 20 and a homebrew beam for 10 (favorite band) complete the picture.

Indiana	K5GOE	.40,955-249-57-A-10	
K9CLO	.71,426-503-71-H-31	W5VUE	.3225-44-25-A-10
W9QAX	.60,634-291-58-A-39		
W9HLH	.8613-86-33-A-12		
W9AYW	.1860-62-10-A-18		
W9SAL	.1377-27-17-A-1		
Wisconsin			
W9PQA	.83,232-410-08-A-31		
K9ALP	.76,248-353-72-A-34		
W9YQX	.53,277-300-59-A-27		
W9VQZ	.43,164-218-66-A-35		
W9CJO	.27,000-300-60-A-		
W9VPI	.22,044-117-44-A-18		
W9JFJ	.19,215-135-47-A-30		
W9EFX	.16,215-115-47-A-26		
K9BEL	.12,230-132-31-A-20		
W9GIL	.11,374-121-47-B-11		

Michigan	M4taksttptf	
W9EDX	.186,880-854-73-H-26	
W9WVO	.50,620-384-65-H-25	
W9TCF	.19,415-154-43-A-23	
K9LJP	.14,932-119-42-A-23	
W9CEL	.13,320-111-40-A-28	
W9KBT	.11,400-100-38-A-28	

Tennessee	W4IGW	.29,917-150-03-A-34
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Meet W2VCZ, NNU winner. A Ranger, Viking I, NC300 and 75A4 in addition to beams galore have also helped Bob acquire DXCC, WAS, WAC, and WBE. Hudson Division honors to W2VCZ by virtue of 570 QSOs with all 73.

THE
SECOND
OP

K4CSY	.16,770-130-43-A-15
W4TDZ	.11,908-115-52-B-11
W4OGG	.3300-55-20-A-6

GREAT LAKES DIVISION

Kentucky

W4KZP	.60,481-331-61-B-1
K4DTI	.42,220-227-63-A-20
W4CDL	.19,250-175-55-B-24
W4YNQ	.27,030-230-26-A-5

Michigan

K5CPM	.52,470-268-66-A-35
W5VXV	.33,291-207-54-A-25
W5LOX	.8303-67-41-A-11
W5NBN	.5600-88-32-B-12
W5IDJ	.2310-35-22-A-3

Minnesota

W5MOW	.29,568-176-55-A-11
W5TFL	.25,361-160-53-A-17
W5WLM	.25,032-168-53-A-17
K5AJV	.22,708-166-48-A-30
W5PWH	.17,064-119-48-A-17
W5GKB	.16,470-122-45-A-16
W5CCD	.13,635-101-45-A-16
W5PLQ	.13,324-117-38-A-8
W5GQZ	.12,360-104-40-A-20
K5KZ	.11,638-202-58-A-33
W5VW	.10,793-104-40-A-20
W5LRL	.6670-115-29-B-16
W5GKQ	.6368-100-32-B-12
W5BMX	.5148-66-26-A-12
W5PSC	.5032-69-37-B-7
W5BFH	.4960-63-32-A-8
K5KZ	.4212-53-27-A-8
W5TIZ	.4055-100-38-A-18
W5BSR	.2833-37-27-A-13
W5FNX	.2722-63-22-B-8
W5QAV	.2550-50-17-A-7
K5DBU	.1887-37-17-A-7
W5FKN	.1701-32-18-A-7
K5KZ	.1684-32-18-A-7
W5NNH	.1584-33-16-A-6
W5FND	.1350-23-18-A-6
W5TTJ	.1212-41-16-B-7
W5SEQ	.975-25-13-A-3
K5DVZ	.848-29-16-B-5
W5MWE	.791-21-13-A-5
W5RJL	.692-21-13-A-5
W5NDJ	.648-18-12-A-4
W5EQG	.570-19-12-A-4
K5CTL	.546-21-13-B-5
W5ZEU	.90-10-3-A-1
W5MAE	.72-12-2-A-2
W5VJL	.60-5-4-A-1
K5CCW	.54-4-4-A-1
W5BUQ	.21-7-1-A-1

Ohio

W5VZ	.22,745-100-40-A-10
W5VY	.22,044-117-44-A-18
W5JFJ	.19,215-135-47-A-30
W5EFX	.16,215-115-47-A-26
K9BEL	.12,230-132-31-A-20
W9GIL	.11,374-121-47-B-11

W5PZR (W5PZ QSY)

W5DQK	.152,643-700-73-A-39
K5ILN	.56,406-278-68-A-28
W5WMQ (W5WMQ, K9AFF)	.009-50-27-A-14

HUDSON DIVISION

Eastern New York

K2TCID	.2, 95,220-462-00-A-10
W2S2Z	.1, 11,070-90-11-A-14
K2ZAU	.6335-11-35-B-14
K2YNM	.6177-71-29-A-11
W2KSH	.4091-51-27-A-10
K2CJJ	.225-13-9-B-4

N. Y. C. L. I.

K2SGO	.58,500-300-65-A-33
K2KMDL	.38,780-225-68-A-33
W2OQL	.32,118-205-53-A-24
K2SIF	.32,076-198-54-A-25
K2TSW	.31,136-206-51-A-36
W2ZUM	.27,432-191-48-A-25
W2JZB	.25,702-201-42-A-23
K2VBU	.23,700-190-48-A-23
W2MCO	.24,780-210-59-A-29
K2AAN	.23,814-163-19-A-12
W2JFU	.16,448-128-43-A-14
K2UBB	.16,319-127-43-A-8
K2VBM	.14,706-105-43-A-1
W2EHB	.12,250-100-48-A-29
K2GIC	.10,606-103-34-A-17
K2IYS	.5589-70-27-A-15
K2YQX	.5000-53-33-A-13
K2GJF	.4929-55-31-A-13
W2IAV	.3825-77-25-B-7
W2VW	.3036-70-25-B-7
W2MQB	.33,400-50-33-B-5
K2RYC	.2280-38-20-A-4
W2C18	.2250-50-15-A-16
K2UOE	.1050-22-16-A-3
K2SFR	.756-28-9-A-6
K2LQZ	.528-16-11-A-5
W2JWQ	.495-15-11-A-5
K2AAW	.216-12-6-A-3
K2IDR	.21-7-1-A-7
W2YSL	.2-1-1-A-2
W2PDU (2 opns)	
W2NBE (2 opns)	

Northern New Jersey

W2VCZ	.124,830-570-73-A-40
K2EYZ	.39,150-225-58-A-18
W2PEV	.27,705-177-55-A-29
W2BTG	.16,254-126-43-A-1
K2DZQ	.5106-69-30-A-20
K2FQF	.5016-60-30-A-20
W2ZFB	.394-19-18-A-8
K2GFR	.649-18-12-A-14
K2YFE	.528-17-11-A-5
K2VQZ	.378-14-9-A-2
K2LSU	.105-7-5-A-5
K2THR (K28 MMM THR)	.8034-106-20-A-10

MIDWEST DIVISION

Iowa

W9UDO	.33,981-243-47-A-22
W9ORX	.31,200-260



San Joaquin Valley Section was notably represented by W6ZZC, who scored a sizeable 92,664 points. Earl is active in the Mission Trail Net and Northern California DX Club and holds the presidency of the Delano Amateur Radio Club. In addition to public service awards, W6ZZC has earned WAS, WAC, and DXCC-phone.

Washington

W7BSW	133,152-608-73-A-35	W0BWJ	26,880-160-50-A-13
W7BLX	100,022-524-64-A-36	W0CYT	21,009-149-47-A-~
W7HJA	42,756-258-56-A-17	W0NWW	18,060-210-46-B-13
W7ZDQ	40,620-288-55-A-21	W0GQY	10,801-120-12-B-11
W7EVS	34,500-231-50-A-30	K9DCW	5148-73-34-A-18
W7VMB	19,475-134-49-A-19	W9ZFU	2618-39-23-A-6
W7CCY	11,600-107-37-A-11	K0KPV	819-20-14-A-5
W7IKK	10,121-87-39-A-6	K9ITX	702-22-12-A-3

PACIFIC DIVISION

Hawaii

W4GYX/KH6	64,142-357-61-A-36
KH6LJ	6216-84-37-B-4

130,065-667-65-A-38

W7ZOR

1242-23-18-A-5

Utah

W7ZOR

1242-23-18-A-5

Nevada

W7ZCA

93,000-500-62-A-38

W5MYL

121,095-594-69-A-40

W5NXP

71,400-519-70-B-33

W5FHIL

36,288-280-49-A-22

W5UNB

6-2-1-A-1

W5M

60,756-334-61-A-38

W6BRY

121,890-600-68-A-35

W5KHE

15,582-106-49-A-25

W6LDO

6736-62-37-A-7

W6VM

16-16-A-4

W5M

41,925-216-65-A-33

W4LNU

41,925-216-65-A-33

W4CTU

69,130-701-67-B-35

W4HKJ

60,756-334-61-A-22

W4BCN

57,800-300-64-A-29

W4KVV

41,91-256-55-A-22

W4KJ

36,338-214-57-A-13

W4RWX

21,900-147-50-A-11

W4IZL

10,248-123-42-B-8

W4IXG

1354-28-16-A-1

SOUTHEASTERN DIVISION

Alabama

W4LNU

41,925-216-65-A-33

W4CTU

69,130-701-67-B-35

W4HKJ

60,756-334-61-A-22

W4BCN

57,800-300-64-A-29

W4KVV

41,91-256-55-A-22

W4KJ

36,338-214-57-A-13

W4RWX

21,900-147-50-A-11

W4IZL

10,248-123-42-B-8

W4IXG

1354-28-16-A-1

East Bay

W6PQW

147,384-815-61-A-38

W6BRY

121,890-600-68-A-35

W6KHE

15,582-106-49-A-25

W6GHC

332-7-7A-1

Eastern Florida

W4CTU

69,130-701-67-B-35

W6GTC

53,295-295-61-A-31

W6GND

18,740-135-46-A-8

W6GXA

77,184-392-67-A-35

W6ZTY

66,144-334-64-A-26

W6QLD

32,550-226-50-A-28

W6ZEK

2673-33-27-A-2

W4FGB

71,264-524-68-B-33

W4MOB

25,380-235-54-B-26

K4HIG

12,987-117-37-A-20

W4HIZ

69,12-74-8-B-9

W4CEP

32,880-30-33-B-5

W4ZIF

12,226-104-39-A-12

CO3HD

12,226-104-39-A-12

W4CTU

12,226-104-39-A-12

W4LNU

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4BCN

12,226-104-39-A-12

W4KVV

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4RWX

12,226-104-39-A-12

W4IZL

12,226-104-39-A-12

W4IXG

12,226-104-39-A-12

W4CTU

12,226-104-39-A-12

W4LNU

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4BCN

12,226-104-39-A-12

W4KVV

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4RWX

12,226-104-39-A-12

W4IZL

12,226-104-39-A-12

W4IXG

12,226-104-39-A-12

W4CTU

12,226-104-39-A-12

W4LNU

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4BCN

12,226-104-39-A-12

W4KVV

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4RWX

12,226-104-39-A-12

W4IZL

12,226-104-39-A-12

W4IXG

12,226-104-39-A-12

W4CTU

12,226-104-39-A-12

W4LNU

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4BCN

12,226-104-39-A-12

W4KVV

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W4KJ

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W4RWX

12,226-104-39-A-12

W4IZL

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W4IXG

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W4CTU

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W4LNU

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W4KJ

12,226-104-39-A-12

W4BCN

12,226-104-39-A-12

W4KVV

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W4KJ

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W4RWX

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W4IXG

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W4CTU

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W4LNU

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W4KJ

12,226-104-39-A-12

W4BCN

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W4KVV

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W4IXG

12,226-104-39-A-12

W4CTU

12,226-104-39-A-12

W4LNU

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4BCN

12,226-104-39-A-12

W4KVV

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4RWX

12,226-104-39-A-12

W4IZL

12,226-104-39-A-12

W4IXG

12,226-104-39-A-12

W4CTU

12,226-104-39-A-12

W4LNU

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4BCN

12,226-104-39-A-12

W4KVV

12,226-104-39-A-12

W4KJ

12,226-104-39-A-12

W4RWX

12,226-104-39-A-12

W

Strays

The National Bureau of Standards, Central Radio Propagation Laboratory, desires applications from qualified persons interested in operating upper atmosphere scientific recording equipment at Antarctic stations during 1959. Application on Standard Form 57, obtainable at local post offices, should be submitted immediately to Section 82.10, National Bureau of Standards, Boulder, Colo. Applicants should have a degree in electrical engineering or physics, with two or more years practical experience in electronics — or — two years technical education leading to an engineering or physics degree, plus four years practical experience in electronics. The practical experience can include active amateur radio experience. Appointments will be made in grades GS-9 to GS-12, salary range from \$6250 to \$8645 per annum, plus 25% ice differential. Training will commence during July, 1958. Personnel will leave for Antarctica during October or November, 1958, and return to the U. S. in January or February, 1960.

The U. S. Civil Service Commission is looking for electronic technicians to fill a number of posts in this country and abroad, for installation, maintenance, research and development. Salaries range from \$3175 to \$7570. Applications should be made on Form 5001-ABC, which is available from any post office or civil service regional office.

If you'll check back to page 38 of *QST* for March, 1958, you'll find mention of high-altitude nuclear bomb tests and their possible effects on propagation. This is just a reminder, as the bomb tests are now in progress.

The Arizona Amateur Radio Club has achieved the distinction of being named a member of the United States Auto Club as expression of gratitude for the work the club has done in providing communications at the big car and stock car races in Phoenix. The club brings in its mobile stations and provides track communications so that the races may be controlled better during emergencies. The hams also report the apparent condition of the cars as they roll past — helping to cut down the accident rate.

Those who struggled through the small print in last month's C.W. Sweepstakes results may remember this statement: "Kids were plunging en masse into their first contest but were any younger than 12-year-old KN6DJC?" Michigan's KN8HLR and East Massachusetts' W1NJL advise they were tied at age 11 the first week end, although NJL's twelfth birthday fell on November 12 before the second period. Any more challengers for youngest SSer? . . . Reading the part about "the three ambidextrous types we know of who transmit and write simultaneously," K9ELT lays claim to being number four, "but it ain't easy," says Phil.

DX Contest High Claimed Phone Scores

Here are scores claimed by phone entrants in the 24th ARRL International DX Competition held last February and March, with score, multiplier, and QSO total shown in that order.

Single Operator

W8AJW	82,943	119	233
W5KC	74,763	117	213
K4QVK	71,868	113	212
W3DRD	70,902	117	202
W4EFX	68,145	105	217
W3ALB	64,808	96	240
W3KDD	63,038	102	204
W4AIX	62,493	111	189
W9GIL	60,480	112	180
W3KT	56,358	93	202
W3DQK	54,900	100	183
K4CTU	54,038	114	158
K2OPJ	53,010	93	190
W1QWI	140,840	140	336
W3ECR	136,320	160	284
W1FZ	134,368	136	330
W1BIIH	129,297	141	309
W6AED	122,715	135	303
W8SDD	109,988	130	282
W1GET	103,750	125	284
W3LYE	99,144	136	243
W6GEK	97,333	131	251
W4NBV	92,136	132	234
W5EVL	91,390	130	237
W1JCX	86,961	123	237

Multiple Operator

W3AOH	308,940	190	542
W3VKD	267,698	181	493
W6AM	238,268	186	429
W8NGO	222,838	179	415
W6NJU	148,260	140	353
W3FYS	122,265	143	285
W3BES	120,984	142	284
W3KFQ	114,750	125	306
W3CGS	93,330	122	255
W9IRH	68,742	114	201

Single Operator

XE1RE	46,110	53	290
VQ4FK	43,344	28	516
G2ACC	35,898	37	324
DL4YE	35,532	28	423
DL4OU	31,314	34	309
I1ZFT	26,358	23	382
Q6SDG	22,830	22	347
C03HD	22,680	27	280
VR2BC	22,275	28	297
OA4V	22,032	34	217
PA0VB	18,600	31	230
VK5XN	18,090	18	335
VP4LO	17,010	21	270
CX1AK	16,925	25	227
GM6GZ	13,770	15	306
KA2LL	12,750	25	170
CR4AS	12,600	25	168
LA4HF	12,267	29	141
F7BX	10,149	17	197
PA0ZJ	10,035	15	223
KX6AF	117,183	53	737

A preview of high e.w. totals is slated for next month's *QST*.

KN8HTI and KN8ITH sit next to each other in school.

W3VKD, of the *Ham Register*, is also quite a statistician. He examined the May issue of *QST* very carefully, and came up with the information that the word "Ham" had been used 160 times in that issue.

K9ISP says that K9JIN was his first QSO as a Novice, his last QSO as a Novice, and his first QSO as a General — none of this by prearrangement.



The base of Almirante Brown (LU1ZE, LU6ZS) perched on the rocky shore of Palmer Peninsula, is shown at the left, while at the right is the Chilean Naval base of Arturo Prat (CE9s AT, AU, AV) on Greenwich Island, South Shetlands.

I WAS one of the many fortunate individuals to get to Antarctica because of the increased activity during the IGY. An invitation by the Argentine Navy to join the 1957-58 Argentine Antarctic Expedition was accepted in order to conduct a bacteriological study on Antarctic birds. Unfortunately, the short time between invitation and expedition did not allow time to procure portable ham equipment or to secure permission for amateur operation. A week in Buenos Aires was completely occupied with the setting up of a laboratory on the icebreaker *Gral San Martin*. The first day at sea permission was obtained from the skipper, Capitan R. A. Capurro, to operate the ship's gear using the call LU2DEE/MM of Petty Officer Hugo Vacis. During the trip to the Antarctic a few 20 meter c.w. contacts were made.

During the three-month trip opportunities to go ashore to collect birds took me to American, Argentine, British and Chilean bases and gave

me a chance to see the rigs and talk to the operators. Among the stops made were the Palmer Peninsula bases of "Esperanza" at Hope Bay (LU6ZV) and "Almirante Brown" on the Danco Coast (LU1ZE, LU6ZS). Bases visited in the South Shetland Islands were "Teniente Camara" on Half Moon Island (LU's 1ZS, 2ZS, and 1ZT) and "Arturo Prat" on Greenwich Island (CE9's AT, AU and AV). The South Orkney base of "Oreadas" on Laurie Island has the call LU1ZA. Bases visited on the Weddell Sea shelf ice were "Gral Belgrano" (LU's 4ZX, 5ZX, 8ZW), "Ellsworth" (KC4USW) and "Halley Bay" (VP8's CI, CK, and CY). The rarest DX spots visited were the uninhabited South Sandwich Islands of Zavodovski which has a live volcano and a Russian house on it and Southern Thule which was the site of LU2ZY's DXpedition.¹

The Argentine, British and Chilean bases use the regular communications equipment for amateur work between traffic skeds when the bands are open. At Halley Bay the only free time is from 18 to 43 minutes past the hour — these boys will never make RCC. The transmitting and receiving equipment was different at most bases. For example at "Teniente Camara" the transmitters were Argentine Navy 40 watt A3, 100 watt A1 jobs with U. S. war surplus receivers; BC-610s and HRO-5 TAs at "Gral Belgrano"; Collins Gear at "Oreadas" and a new GPT-750 with HRO-60s at "Arturo Prat." Despite the age or the power of the rigs they really put out, probably because of large rhombic antennas at most of the stations. The Argentine and Chilean bases, like the American bases, are military operated (mainly Navy) and certain calls are assigned to each base. In the case of the Argentine bases one call is usually used by the base, and others are assigned to the radio operators and commanders who request a separate call. Most operation at these bases is on the 20

* 213 Fairview Avenue, Blacksburg, Virginia.

¹ Ahumada, "South Sandwich DXpedition", *QST*, June 1956.

Amateur Activity in the South American Quadrant of Antarctica

BY
JOHN McNEILL SIEBURTH* K4MKN

meter band and most stateside contacts are on c.w. due to the rudimentary English of the majority of the operators. The Chilean bases have separate calls for the c.o., exec and the enlisted men. At the British bases, which are civilian run, it is an individual matter with those who qualify getting VP8 calls. The American bases have one call only and the ham shack with separate Collins gear is operated mainly by the off-duty radio operators. Amateur activity in the Antarctic is primarily for radio contact home for morale purposes. Many of the operators have never had their own call or even been previously interested in amateur radio and are operating with special temporary licenses. The few who are dyed-in-the-wool hams are doing a good job at hamming for hamming's sake, new states, new certificates, etc.

Besides the few 20 meter c.w. contacts made from the *San Martin* I had two opportunities for operation ashore. At "Gral Belgrano" a few 20 meter phone contacts were made using the call LU5ZX. I was fortunate in being able to stay at

"Teniente Camara" on Half Moon Island in the South Shetlands from December 25 to January 3 in order to collect specimens. The c.o. and radio operators were very kind in giving me the freedom of the radio shack between traffic schedules to operate LU1ZS. The first four nights were spent on the 20 meter c.w. band until I found out with W7HTB's help that 40 watts A3 input to a rhombic could get a 5 by 9 signal stateside. Amateurs from Hawaii (KH6OR) to Poland (SP8CK) and as far north as the Arctic Circle (VE8NW) were worked. In all 33 c.w. and 83 phone contacts were made. This operation as well as meeting personally with the ham operators at the various bases was a big thrill for me. Hams worked from more than one location were W3ROA, W4EPA, and W5JUE. These FB amateurs as well as W2HBV, W4UKA, W4ROK, K4CKZ, K4INN, W5VU, W8GZL and VE7JB did a wonderful job in keeping my XYL and parents supplied with messages and Christmas and birthday greetings.

Strays

K6OKF got a complaint from a neighbor who couldn't hear him on the TV set. Seems that the neighbor liked to hear K6OKF because he thought the ham conversations were more interesting than the TV programs. — *K6USI*

W9ZZU, Illinois district commander of U. S. submarine veterans of WWII, announces that another reunion will be held at St. Louis, Mo., on August 14-17, and he hopes that more ham veterans of the subs will be able to attend.

QST is among the 510 periodicals that are indexed by subject and author by the U. S. Naval Research Laboratory. The original index cards are to be reproduced in book form by offset printing, 21 cards per page, 10 by 14 inches, by Micro-Photography Co., 97 Oliver St., Boston 10, Mass. The publication will be available only to those who subscribe in advance of printing which will start in the third quarter of this year.

W3AXT reports a real weird one overheard on a marine telephone channel. The marine operator was having trouble reading the boat, and so she said, "I am not reading you so good just now, sir. Will you please try to come in a little clearer." (If this works we sure gotta try it on some of the 14 Mc. stuff we've been having difficulty with lately!)

W2BR tried to reach K2VOS on the telephone at his office, but was told that K2VOS was out of town. So W2BR turned on his rig to do a little hamming. And who do you suppose he heard and worked right away?

KN3DHX, KN8HLR and K8CPR are all named Bob Epstein. Any other hams having this name might drop a note to KN3DHX at 2803 Jenkintown Rd., Ardsley, Pa.

Silent Keys

IT IS with deep regret that we record the passing of these amateurs:

W1KML, Steve Dudas, Bridgeport, Conn.
W1RTG, Eli Crumb, Norwich, Conn.
W2BZL, Charles Kerr, Baldwin, N. Y.
W2CXY, Fred M. Maude, Fulton, N. Y.
W2DXT, Milo B. Atkinson, Tuckahoe, N. Y.
W2I9O, Ainsley A. Carson, New York, N. Y.
W2PAG, Joseph A. Gaetane, Flushing, N. Y.
ex-W3LG, Henry H. Lyon, Hyattsville, Md.
W3TCI, James C. Everingham, Selinsgrove, Pa.
W4BLE, William G. Beverly, Norton, Va.
K4CPG, Charles W. Roberts, Birmingham, Ala.
W4DD, Stephen J. Buckley, Jr., Birmingham, Ala.
W5AKY, Elbert A. Allen, Pass Christian, Miss.
K5BOP, Rolen P. Woods, Oklahoma City, Okla.
W6AK, Loyal D. Mealer, Walnut Grove, Calif.
K6DM, Clyde C. Anderson, San Mateo, Calif.
W7DYH, Albert J. Wade, Bremerton, Wash.
W7JPK, Edward P. Arildson, Millwood, Wash.
W7JQQ, Neville E. Walker, Portland, Ore.
W7KJ, Kenneth R. Jones, Boise, Idaho
W7KKZ, Cecil V. Thomas, Seattle, Wash.
W7QVX, Alfred J. Hobbs, Arco, Idaho
K8GEL, Miri Garrod, East Palestine, Ohio
W8VFP, Dale L. Townsend, Miamisburg, Ohio
W91YP, Donald R. Larimer, Burlington, Wis.
W9UGI, Arthur L. Harris, Beardstown, Ill.
KN6LBI, George F. Smalley, Wichita, Kans.
W9SYM, Herbert W. Jones, Omaha, Nebr.
VE1SL, George LeBlanc, Dieppe, N. B.
VE3BGK, Charles Hall, Kirkland Lake, Ont.
XE1VA, Jose Polak, Mexico, D. F.

Working WLP

(Without Landlord's Permission)

BY EDWARD L. HAYDEN,* K2TFV

THE IDEA for the WLP award occurred to me through a series of unnatural events which began by my moving into a New York City apartment. To qualify, you must simply work WAS, WAC or DXCC, have a confirmation for each contact, then get your landlord to verify that each contact was made without his permission. This will make you eligible for the difficult WLP award.

Being a small town boy, my object in becoming a ham was for relaxation and diversion. The strain of working completely relaxed in the casual atmosphere of the big town left me something less than that at the end of the day. When a friend, W2JSL, suggested ham radio as a means of enjoying life, I readily embraced the suggestion. My wife, now the XYL, of course, concurred, lest I get that unloved look so prevalent among some whose wives won't let them become hams.

In due time I received my license and brand-new call letters and arranged my equipment, a newly acquired SX96 and an ancient crystal-controlled 40-watt transmitter, in the corner of the bedroom.

I started thinking about an antenna, and it was then that I became aware that the existence of the landlord had more significance than merely that of collecting the rent.

"Honey," came the XYL's voice from the department of documents, "did you read the small print in the lease? . . . outside antennas, here-with and specifically forbidden . . . no electrical installations without express permission of the landlord."

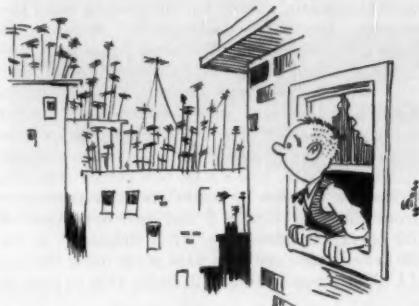
Thus I assumed my cloak-and-dagger personality, since it was now apparent that I would have to operate surreptitiously. With this in mind, before setting up Occupation Undercover, I dispatched the XYL and jr. ops. to do some reconnoitering in what can now only be classified as enemy territory.

The jr. ops. came back with only one bit of advice — give up and buy a larger TV set. The XYL reported that we were, indeed, surrounded. There were literally hundreds of apartments around us, a solid front of entrenched TV addicts, all of whom suffer painful withdrawal symptoms should TV be taken from them.

Recently an harassed TV repairman barely escaped with his life when he attempted to remove a set to his shop for alignment. He was beset by hysterical kids, a raving mother and a mad family dog. They would fight from the rooftops, if need be.

One neighbor, it was discovered, was continuing to watch TV through dark glasses even though

* 68-43 Cloverdale Blvd., Bayside 64, L. I., New York.



his doctor had diagnosed embryonic carcinoma of the eyeballs due to excessive kinescope radiation.

I learned that one ham actually did try to operate but was readily discovered and exiled to operating mobile only. The neighbors were unmoved, though, even at the sight of his XYL trudging out on a bitterly cold winter's night carrying hot coffee through the snow to her OM while he operated mobile at the curb.

My head was bloody but unbowed, so late one night I strung about 60 feet of number 20 wire outside the bedroom window and attached it to the end of a clothes line pole, with the thought in mind of removing it before dawn. I didn't even get a chance to load it up; a drunken neighbor, staggering home from an office party, caught the low end of my invisible antenna with his head and snapped it — the antenna, that is. (I found out through the grapevine that he roundly thrashed his wife for setting a booby trap for him that night.)



When the XYL saw my frustration over this antenna problem, she solved it with one of her choice statements. "If you can't put it on the roof, put it under the roof." Which, of course, was the answer. I fed the thin wire up through the ceiling and around the crawl space under the roof in somewhat the shape of a pig's tail and loaded it up on 40 meters.

I then commenced my calling marathon. I called CQ for a solid week. I called CQ so often that my right hand kept moving after I went to sleep at night. Then it happened, I got an answer. W3MHO down in Pennsylvania answered.

I broke into a cold sweat and froze. My hand would no longer move, and my impulse was to shut down the transmitter and hide in a closet; but I got control of myself and completed my first QSO.

It was lovely, a wonderful lift. I approached my job that following day with a fresh new outlook.

That evening the XYL gave me the news that poked a few holes in my fresh new outlook. Our neighbors had called in the landlord to check and attempt to find the source of what they referred to as a very peculiar click, click, clicking noise coming from the ceiling. Faulty wiring was ruled out, but the possibility of poltergeists was considered. If the noise continued, the landlord advised them, an expert from the National Ghost Society could be called in to investigate.

I had not considered the noise problem before, but it was quite true that the noise from the manual key was greatly amplified at night, not to mention the noise from the heavy toggle switches on the old transmitter. I had kept the power down to approximately 40 watts to prevent TVI. Even though rabbit-ear antennas were being used, there were hundreds of them grouped around. I had something of the same feeling when the ammunition ship I was on during World War II got lost in a mine field.

It was now clear that a few more rules would be required if my survival as a ham was to be insured. I could not be concerned with tropospheric and ionospheric scatter or gamma-match antenna systems or the s.w.r. or the effect of source beam width on stacking. My challenge was to outwit the landlord. I jotted down a few basic rules that I felt would be essential to this end.

1. Operate only during the hours when TV is off or at a minimum.
2. Use a bug and operate it from an insulated box.
3. Eliminate toggle switches.
4. Use c.w. and earphones only.
5. Use minimum power.
6. Keep curtains pulled at all times.
7. Buy a sunlamp.

While waiting for my bug a new development created a temporary deterrent to my project: the QSL card. W3MHO came through with my first card, and I viewed it with mixed emotions. All mail for our apartment is thrown into a com-

mon hallway where each tenant thumbs through it, picking out his own. Needless to say QSL cards would attract attention. In fact this first card was picked up by a neighbor and handed to my wife with the remark that it was a "funny-looking postcard." She is probably still wondering what BCNU AGN means.

However, with the arrival of my bug I started operating again, and the XYL met the mailman at the door and quickly screened out the QSLs. Then at Christmas, with no ulterior thought in mind, we gave the mailman a carton of his favorite cigarettes. Thereafter, the QSLs were pushed under our door, a service unknown in this area.

After several months of late hours, bleary-eyed operating, I had managed to work about 20 states and one Canadian, VE3EHM. Each new contact was like picking pearls from an oyster, but it was approaching hard work. My original reason, relaxation and diversion, for becoming a ham was only half fulfilled, plenty of diversion, no relaxation.



I ran across an ad for the new Viking Navigator about this time, so I called up Mel and asked him to send one out. It is a compact little-transmitter/exciter with a built-in v.f.o., band-switching, time sequence keying and 40 watts input on c.w., and it should be ideal for my needs. It was. I may be criticized for not building my own equipment, but the space problem in some of these New York apartments is critical. I would be afraid to fire a soldering iron for fear that I would overheat the apartment. I could lie in bed and operate the rig with my feet if I had a mind to.

I removed my pig's-tail 40-meter antenna and replaced it with a 15-meter doublet in the same area under the roof, running it just over the cross beams and about 6 inches from the master TV antenna, which, fortunately was not connected. I used 72-ohm coax for the transmission line, and secured everything with masking tape. The hotwater radiator was my ground. I found that by cutting the radiator on or off I could vary the loading of the antenna.

With my new antenna and 40-watt Navigator I started working out on 10 and 15 meters. I was astounded at my success. In quick order I worked

(Continued on page 168)



Correspondence From Members -

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

N.S.B. COMMENTS

1110 Magnolia Avenue
Panama City, Florida

Editor, *QST*:

This is just a line to let you know how informative I found your article in *QST* on n.s.b. I experimented and found that it is actually all that the author claims and he is to be congratulated on his observations. Certainly, though, it is so complicated that he must have had to have some assistance to arrive at the facts stated here.

I have been experimenting with this mode of transmission since I received my Novice ticket and I was just waiting for someone to write about it. Thanks for fine article.

— *Bart Fay, K4CEF*
2018 Lowell Road
Everett, Washington

Editor, *QST*:

Congrats to Mr. Pickering, W9LRA, for a very fine article which I read with deep interest. Mr. Rapp, sir, look to your laurels: this guy is out for the title.

— *John Habenicht, W7QLH*

2000 Maple Road
Buffalo 21, New York

Editor, *QST*:

The merits of the n.s.b. system proposed by W9LRA will be instantly recognized by all forward looking hams.

However, I would like to point out to Mr. Pickering that his idea has already been patented. On April 13, 1948, the United States Patent Office granted patent number 2,439,661 to Donald B. Keever of Colfax, N. C. This patent states that the "object of the invention is to reduce the channel width required for the transmission of an amplitude modulated wave . . . by the substantially complete elimination of side bands leaving only a wave of varying amplitude and single constant frequency." This classic patent presents an actual schematic diagram for the production of n.s.b.

It is a sad indication of our scientific lethargy that this idea was not instantly utilized by hams, commercial stations, and the military services when it was first proposed over ten years ago.

— *Robert A. Hunting, K2LYZ*

R.D. 2, Blanche Avenue
Elyria, Ohio

Editor, *QST*:

At the risk of being considered selfish, may I say that I am disgusted that W9LRA has seen fit to divulge information regarding n.s.b. emission.

Those of us who have had some part in developing n.s.b. to its present state of perfection have enjoyed its advantages in relative privacy thus far. Often when it is impossible to punch through on a.m., d.s.b., and even s.s.b., we often find it possible not only to get through, but to enjoy solid 100% QSOs on n.s.b.

We therefore ask you to refrain from publishing further details regarding this system. If others wish to join our group, and to enjoy its advantages, let them develop the necessary proficiency and ability in its use as we have — the hard way. In that way you can help to raise the level of the "state of the amateur art," so to speak.

— *Bill Wildenhain, W8YFB*

DX CHASERS

Seaford, New York

Editor, *QST*:

The art of DX at one time was an extremely pleasant hobby from which much enjoyment was derived for many amateurs throughout the world. However, the picture has changed considerably of late and pleasure has turned to bitterness. The amateurs out in the remote spots are bitter because they cannot talk to whom they wish at their leisure due to the hungry DXers completely ignoring all ethics of being gentlemen and good radio amateur operators. This has either driven the rare ones completely off the air or into hiding on bands at times when they cannot be constantly annoyed by the pack. It results in the DXers spending altogether too much of their time hunting the now-in-hiding rare ones down — time which should be spent with their families or in business or studying for the future welfare. Those that cannot afford it spend past their means for equipment so when the rare one does take a chance and come on the air he can be first to work him before the DX station gives up in disgust.

True, if the DX station is interested in working as many Ws as he can, and can afford to QSL, there is no problem. However, it is the right of the DX station to make this decision and operate as he sees fit. The competitive angle of the DXCC in this day and age does not permit him to do this.

We are becoming less mannerly as time goes on, and so must the newcomers as they blossom out — so the only



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3925 KC 6055 KC

— *K2BZC*

9 Baldwin Road
Noxon, New Jersey

Editor, *QST*:

I found Mr. Pickering's article on n.s.b. very interesting and informative and I certainly hope n.s.b. will become more popular. However, in our two years of experience my colleagues and I have found "no sideband suppressed carrier" to be the ultimate in QRM elimination. Perhaps an article on this mode would be in order.

Also, three cheers for *QST*'s more informal presentation of material! Articles such as Mr. Pickering's and Mr. Rapp's provide a delightful change from the usual technical and constructional articles and a little humor between lines in all the articles would certainly add to the enjoyment of the magazine.

— *Ronald Lee, K2SYB*

answer seems to be eliminate some of the tension. Restrict DXCC to an award for working one hundred countries. This will not eliminate the sport for the many but will do away with the tensions now created by the DXers today fighting for the last few new ones. It will give back to the fellows who happen to live in the rare spots a more even chance to enjoy our hobby as was intended.

— Aug. Nickel, W2HJM

NUISANCE . . .

20 Sickles Street
New York 40, New York

Editor, QST:

With all due respects to those who conceived the idea, I think it is about time that we all came to the realization that the creation of the "do-it-yourself" class of license (Novice, Technician) is a mistake that must be corrected immediately. I believe that when it becomes possible for a 10-year-old boy to get a license to operate a radio station and then convinces all of the "Video Rangers" around his vicinity to get one too, in the space of a week, that the state of the art has sunken to its lowest depths.

The Novice is responsible for innumerable tortures suffered by all general class operators on most any of the bands. The "break-break-break-break" and the second and third harmonics accompanied by the chirps and clicks of a newly hatched Novice are only a few. This is in addition to fact that this horrid class of license has caused our ranks to more than double in a very short time. The time has come when the ham is no longer the exception, but rather those who don't have a ticket are the out of place ones. Too bad!

This situation must be corrected at once if we expect to enjoy ham radio in the future. No more Novices, no more cheating on mail exams, and no more Captain Video on the ham bands equal a decent hobby.

— Henry Klapfols, K2VBL

Columbia, South Carolina

Editor, QST:

I would like to register a complaint regarding Novice c.w. width on the 15-meter band. The 150 kc. of Novice c.w. on this band is entirely too much. It is ruining the foreign phone DX on this band and I feel that a change is needed. I have talked to numerous W stations regarding this condition and find them all feeling the same way as I do.

I believe a fair arrangement would be to limit Novice c.w. operation to 21,100 to 21,200 kc. which would leave at least 50 kc. for the DX phone stations. If you can't do anything with FCC about the change, perhaps appealing to the Novice operators to refrain from using 21,200 to 21,250 kc. would help some.

— R. D. Mitchell, W4EDQ

. . . OR NECESSITY?

1006 West Sixth
Hastings, Nebraska

Editor, QST:

Any cause that expects to perpetuate itself needs a constant influx of new blood, and ham radio is no exception. Our Novices need all the encouragement we can give them. Instead of making QRM worse by narrowing the bands available to them, let's widen them out a bit. Instead of feeling sorry for the poor DX chaser on 15 meters, shed a tear or two for the Novice still shaky about copying code, trying to pick up a new state or two in a band full of phone signals. This from a ham of two decades of experience.

— C. B. Wolfe, W6LJO

PERPLEXED

202 Howard Street
Bellevue, Ohio

Editor, QST:

My Novice ticket arrived early in January, and I have been having a ball ever since, but there is one thorn in the whole deal. On fifteen meters I hear some swell DX and have tried four of five antennas but to no avail; either they don't hear me or I just don't get out to them.

Shortly after my first few futile attempts to work that

band, I asked six or seven nearby hams (both Generals and Advanced) to pay a visit and see what they could do on my rig (DX 35, or DX 20, or Adventurer) and find the fault, either with the operator or the equipment. It is said if you can't hear them you can't work them. I can hear seas of DX hams, and can't work them. Surely it can't be the rig — it must be the antenna, but how am I to tell, since not even one of the worthy brothers has seen fit to visit only for a few minutes. I wonder what a fellow has to do or pay for one of the fellows to lend a helping hand?

— M. L. Braun, KN8IQB

DAHDIDIDIDIDIT

Box 1261 C.B.S.
New Smyrna Beach, Florida

Editor, QST:

Received reprint of "Your Novice Accent" in the morning mail. There certainly is a tremendous amount of truth in those four pages.

My vote for number one Lid-of-the-Month is cast for the character who tries to use a bug without lots of practice on an oscillator. I have heard five, six and seven dots used for H, and since when is the letter C dahdidiadidit? I heard CQ being sent just that way this evening.

Funny how different the code sounds on one of those things. I firmly believe it would be to the advantage of all concerned if the FCC would prohibit their use by Novices. Most of them need the practice with a straight key anyway.

— Ricker J. Bodholdt, KN4TDN

THE HBR-14

Oklahoma City, Oklahoma
Post Office Box 8675

Editor, QST:

I thought you might like to know I have built and have had working for several months the HBR-14 receiver (QST, July, 1957). It was constructed using the parts as specified in Ted Crosby's article. I had no trouble getting it into operation. It tunes just as sharp as the article claims and it sounds and tunes similar to the Collins receiver on c.w. On ten meters I do not try to cover all the band with one set of coils (neither does the Collins). Have it adjusted to cover 28,000 to 28,550 kc. It has been a lot of fun building and getting it into operation.

Let us have more on receivers in QST.

— Horace Martinan, W5AYO

113 North Broadway
Siloam Springs, Arkansas

Editor, QST:

I wanted to let you know how swell I think the HBR-14 receiver is that was written up by Ted Crosby, W6TC. I have been on a.s.b. and c.w. the past five years (c.w. and a.m. before that) and have been using a Collins 75A1 and Central Electronics Slicer. The signal-to-noise ratio is so much better that there isn't much comparison, the HBR being so much hotter in every way. I find I don't need a slicer and the 75 kc. i.f. makes the receiver on c.w. a dream almost come true. I might add I have never before built a receiver except a two- or three-tube job in about 1934. Thanks for publishing the article and I might add Ted was more than helpful with suggestions, getting me straightened out on some minor points.

— John Stockton, W5DRW

HOW TO QSL

225 N. Julian Street
Naperville, Illinois

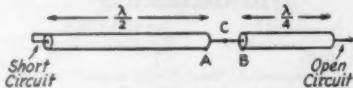
Editor, QST:

You cannot stress too strongly the matter of complete addresses on QSL cards. I have received cards addressed like the following: Dave's RF Plant, K9GSW, Naperville, Illinois, or Dave, K9GSW, A.R.S., Naperville, Illinois. As any two-year-old can see, this is entirely insufficient for the Post Office Department. As there is another amateur with the name Dave in this town, and the calls mean nothing to the Post Office, the cards often are sent to the wrong address. Please put in a plug for complete addresses!

— Dave Harr, K9GSW

Quist Quiz

This problem, sent by Louis Tonik, W3DVB, is one that either you solve immediately or you take a long, long time to figure out.



When two lengths of RG-8/U are connected as shown below, what is the impedance between

points A and B? For clarity, the connection of the inner conductors at C is shown expanded slightly.

The answer to last month's tube-short question is "You can't." Actually the heater, cathode and grid were shorted together within the tube, and the lead from the cathode to pin 5 had burned out in the process. Thus testing the tube with an ohmmeter gave the unusual answer of a heater-to-grid short that didn't involve the cathode.

Quist Quiz Correspondence

THREE RESISTORS IN A BOX

(The April Quist Quiz involved a box with three terminals; resistance measurements between any two terminals showed 20 ohms. Such a box could contain a delta of 30-ohm resistors or a Y of 10-ohm resistors, and the second half of the problem was to determine, without opening the box, which configuration was used. Best answer we had, as reported in the May issue, was to burn out one resistor. This prompted several letters pointing out how simple it was to do without burning out one resistor.)

New York, U. S. A.

Quist Quiz Editor, *QST*:

... that the type of circuit can be determined by connecting a known resistance (in this case 10 ohms) between any two binding posts and measuring the resistance between these posts. The resistance, as determined by the resistance formula, for a delta connection would be 6.66 ohms and with the Y connection would be 16.66 ohms.

(name withheld)

Inglewood, Calif.

Quist Quiz Editor:

Disappointed in your solution! Why not put the "black box" in an r.f. field and test for voltage between terminals? If it's Y, you get nil; if delta you should read voltage. Why not?

—Everett McMullin, W6DSY

Univ. of Colo.
Boulder, Colo.

Quist Quiz Editor, *QST*:

If one assumes pure resistance in the delta wye Quist box, it may be proven mathematically that the two networks are identical as far as the external circuit is concerned, and no amount of measurement could tell one from the other. I suggest placing the box on a photographic plate and putting a bit of radioactive material on top. It seems a fellow named Rcentgen did some work along these lines and came out pretty well.

—Jon W. Osterlund, W9WMK
(But suppose we used a thick lead box? —Ed.)

Texas, U. S. A.

Quist Quiz Editor, *QST*:

Your Quist Quiz in the April issue of *QST* intrigued me and I was surprised that the answer was not given in the May issue. A very simple method exists to find out if the box contains the Delta or Y connection. Put any convenient voltage between two of the terminals on the box. Between the third terminal and one of the other two place a 5-ohm resistor. By measuring the voltage across the 50-ohm resistor the type of connection can be determined. The delta connection will have $\frac{1}{6}$ of the applied voltage across the 5-ohm resistor. The Y connection will have $\frac{1}{3}$ of the applied voltage across the 5-ohm resistor.

(name withheld)

Technical Correspondence

MORE QUAD DIMENSIONS

7 Warwick Road
Chatham, N. J.

Technical Editor, *QST*:

To corroborate W5GGV's findings on the dimensions of the Quad antenna ("Technical Correspondence," *QST*, April, 1957), similar observations were made on several Quads constructed at W2GJD.

The resonated length of one side of the driven element of a one-band cube Quad was found to be about 4 per cent longer than called for by the formula

$$L \text{ (feet)} = \frac{1}{4} \times \frac{984}{f}$$

where f = frequency in Mc.

In other words, the length-correction factor of 1.04 times the formula length gave the practical resonant length.

In the two-band cubical Quad (21 Mc./28 Mc.) the resonated length was found to be about 3 per cent longer than the formula length for each Quad.

In the three-band cubical Quad (14 Mc./21 Mc./28 Mc.), however, the length-correction factor for the 14-Mc. Quad was found to be about 1.06; for the 21-Mc. Quad it was found to be 1.02; and for the 28-Mc. Quad it was also about 1.02.

—Walter Hladky, W2GJD

Happenings of the Month

FCC-IRAC Frequency Proposals

U.H.F. Changes—1800-2000 kc. Changes

FCC-IRAC PROPOSALS

The long-awaited announcement of the views of agencies of the U. S. Government toward the frequency allocation table, in preparation for the forthcoming world radio conference, was made in mid-April jointly by the Federal Communications Commission and the Interdepartment Radio Advisory Committee of the Office of Defense Mobilization. For the amateur radio service, the proposed frequency table includes provision for continuance of every present amateur frequency assignment (with some changes in u.h.f. bands described under another heading in this column), including availability of the Loran band and the 27-Mc. ISM band!

FCC and IRAC indicate they have found the Atlantic City allocations table below 30 Mc. generally satisfactory, and propose only minor changes in that portion of the spectrum, with little or no effect on the distribution of space to the various radio services. Above 30 Mc., past experience in the use of radar and associated devices of radionavigation and radiopositioning requires, in the FCC-IRAC view, considerable expansion of frequency provisions for those techniques, and the table above 30 Mc. is modified accordingly. However, our 6- and 2-meter bands are proposed to be continued intact; above 220 Mc. certain provisions for radiopositioning use of amateur bands, detailed hereinafter, are also proposed.

The joint proposals now go before the allocations committees of the preparatory groups in Washington looking toward the establishment of a final U. S. position.

U.H.F. CHANGES

In mid-April the FCC issued a Memorandum Opinion and Order dealing with its frequency allocations to various services above 200 Mc. The action flows from a request by the Office of Defense Mobilization to expand the provisions for radiopositioning requirements, "which have increased significantly in recent years due to the international political climate and the advent of the 'space age.'" FCC has therefore modified some of the u.h.f. assignments; for example, it has taken some space from non-Government users, such as the fixed and land mobile services and made it available to Government for radiopositioning. The action was taken without notice or hearing, because of the stated urgency involved in national defense considerations.

The order also affects amateur bands, although only in comparatively minor respects. Our 3300-3500 Mc. is shifted, effective immediately, to

3500-3700 Mc. Other amateur assignments above 220 Mc. are continued, but with the Government radiopositioning service also admitted to such bands (except 21,000 Mc.) on a priority basis. See the editorial page this month for additional background.

The language of the amended amateur regulations is published below; these new rules are *now in effect*.

In a related action, Docket 12404, FCC proposes additional changes in u.h.f. assignments to allow for expansion of radiopositioning facilities. These affect mostly services other than amateur; there is only one matter involved of interest to us — a proposal to change the 21,000-22,000 Mc. amateur band to read 22,000-23,000 Mc. The views of the League on this proposal will be determined by the ARRL Board at its meeting in May.

1. §12.111 is amended as follows:

a. Paragraph (j) is amended to read as follows:

(j) 220 to 225 Mc.² using types A0, A1, A2, A3, A4, F0, F1, F2, F3, and F4 emission. In this band the amateur service shall not cause harmful interference to the government radiopositioning service.

b. Paragraph (k) is amended to read as follows:

(k) 420 to 450 Mc., using types A0, A1, A2, A3, A4, A5, F0, F1, F2, F3, and F5 emission. The maximum DC plate power input to the final stage of the transmitter shall not exceed 50 watts. In this band the amateur service shall not cause harmful interference to the government radiopositioning service.

c. Paragraph (l) is amended to read as follows:

(l) 1215 to 1300 Mc., using types A0, A1, A2, A3, A4, A5, F0, F1, F2, F3, F4, and F5 emission. In this band the amateur service shall not cause harmful interference to the government radiopositioning service.

d. Paragraph (m) is amended to read as follows:

(m) 2300 to 2450 Mc., 3500 to 3700 Mc., and 5650 to 5925 Mc., using types A0, A1, A2, A3, A4, A5, F0, F1, F2, F3, F4, F5, and pulse emission. Operations in the frequency bands 2300 to 2450 Mc. and 5650 to 5925 Mc. are subject to such interference between 2400 and 2430 Mc. and between 5775 and 5925 Mc., respectively, as may result from emissions of industrial, scientific and medical devices on the frequencies 2450 and 5850 Mc., respectively. In these bands the amateur service shall not cause harmful interference to the government radiopositioning service.

e. New paragraph (n) and (o) are added to read as follows:

(n) 10,000 to 10,500 Mc. using A0, A1, A2, A3, A4, A5, F0, F1, F2, F3, F4, and F5 emission. In this band the amateur service shall not cause harmful interference to the government radiopositioning service.

(o) 21,000 to 22,000 Mc., and any frequency or frequencies above 30,000 Mc., using A0, A1, A2, A3, A4, A5, F0, F1, F2, F3, F4, F5, and pulse emission.

2. §12.231 is amended as follows:

a. Paragraph (e) is amended to read as follows:

(e) Except as provided in paragraph (d) of this section, at such time as any or all of these frequency bands are withdrawn from availability to stations operating in the Amateur Radio Service, such bands shall be jointly available to stations in the Radio Amateur Civil Emergency service and to stations in the military services for training and tactical operations. At that time, in areas where interference might occur, local mutual arrangements shall be

made regarding times of operation such as to preclude or satisfactorily alleviate interference. In time of actual civil defense emergency, stations in the Radio Amateur Civil Emergency Service shall have absolute priority.

b. New paragraph (d) is added to read as follows:

(d) In the band 220 to 225 Mc., stations operating in the Radio Amateur Civil Emergency Service shall not at any time cause harmful interference to the government radio-positioning service.

(Refer to White Sands restrictions, ED.)

1800-2000 KC. CHANGES

Continued expansion of the Loran navigation service, which has absolute priority in 1800-2000 kc., has required the withdrawal of a portion of the privileges available to amateurs in that portion of the spectrum under a sharing arrangement. Effective May 10, 1958, the band segments 1875-1925 kc. are withdrawn from amateur use. This action stems from national defense considerations involved in the establishment of additional Loran stations operating on 1900 kc. at locations along the seacoasts of the U. S. and its possessions, and the interference protection made necessary thereby. Henceforth, amateurs may continue to use only the 1800-1825 and 1975-2000 kc. segments under the geographical and power restrictions already in force.

NATIONAL CONVENTION

The Tenth ARRL National Convention in Washington, D. C., August 15-17, continues to shape up as a major vacation attraction this summer. By the time this is in print, the Federation of Radio Amateur Clubs, Inc., will have

all details in a brochure. In the meantime, queries for information (and checks for registration and events as listed in April QST) can be sent to the Federation at P.O. Box 3726, Washington 7, D. C. All hotel reservations can be handled by addressing the ARRL Convention Housing Bureau, 1616 K St., N.W., Washington, D. C.

Although no names have yet been announced, the most prominent amateurs in Government, including the Armed Forces, are slated to participate in various sessions and at the major functions. A convention communications system has been devised which will make instantly available from a central desk anyone attending the sessions, social affairs, sightseeing or other tours. Under guidance of the SCM, Louis T. Croneberger W3UCR, the system also includes an elaborate "talk-in" network of mobile frequencies to aid the mobileer on his way to the big show.

Daily convention news will be printed in daily issues of the "Auto-Call," the widely-circulated journal of Washington-area hams, throughout the convention period. "Andy" Anderson, W3NL, editor and publisher, has installed brand-new equipment for speedy handling of news and photos to meet the schedule.

On the exhibits side, the plans of leading ham-gear manufacturers, distributors and the various Government agencies are taking form as this report goes to press. Exhibits Chairman John M. Boland, W4CC, says all armed forces will be represented by displays.

Strays

W2OLU tells us that when his *Hints & Kinks, License Manual, Antenna Book*, etc., get too dog-eared, he used Scotch electrical tape #33 to reinforce the binding and the tattered edges. (Don't forget, though, that we publish a new edition of the *License Manual* every six months!)

The Hilltop Transmitting Association (W3ZGD), of Red Lion, Pa., awards a box of Red Lion cigars to anyone who works five Red Lion hams. The secretary of the club is Mr. Marion E. Bollinger, RFD #1, Box 21, Freeland, Md.



During the recent DX contest W9NH worked CN8QU, KH6IJ and VP7NG on all bands 160 through 10 meters.

Not so very long ago W1FTX moved out to a nice hill-top location in the wilds of Connecticut, where he figured the noise level was low and the DX good. But now he wonders. The other morning he was awakened by a loud and persistent clanging in the yard. After a bit he discovered a woodpecker sitting up on top of his 6-meter beam and pecking away at the aluminum boom. By this time that bird must have an aluminum beak.

We thought you might like to take a look at Gil, W1CJD, QST's cartoonist for many, many years. His first contribution appeared in the June, 1927, issue, and his style has been a QST trademark ever since. His keen appreciation of the flavor of ham radio comes in part from the fact that he is an active ham, mostly on the 80-meter traffic nets, where he can be heard nearly every night. By day, he is city editor of the Middletown Press.

QST for

Board Meeting Highlights

The Board of Directors of The American Radio Relay League, Inc., held its 1958 meeting at Hartford, Connecticut, on May 9. During the meeting the Board examined at length the status of the amateur radio service in preparatory committee work for the forthcoming International Telecommunications Conference.

To promote v.h.f. DX and further amateur contributions to knowledge of long-distance propagation in that portion of the spectrum, the Board voted to request amendment of the amateur rules to provide exclusive c.w. band segments of 100 kc. each at the low ends of the 50- and 144-Mc. bands, with a special plea for prompt action by the Commission so that, if adopted, the new provisions could be useful in amateur participation in the program of the International Geophysical Year. Reviewing its 1956 request of FCC for a 50-kec. expansion of the 14-Mc. voice band (not yet acted upon by FCC), the Board decided to amend its petition by deleting the proposal to limit use of the band segment to Advanced or Extra Class licenses.

In view of the imminence of an international conference, the Board voted to oppose the Commission's proposal in Docket 10237 but countered with a request for amendment of the amateur rules to provide coastwise operation on all amateur bands with all modes of emission. It instructed the filing of League comment in support of the FCC proposal to shift the amateur 21,000-Mc. band to 22,000-23,000 Mc.

An application by the Galveston County Amateur Radio Club to conduct an ARRL National Convention in Galveston, Texas, during 1959 was approved, but the Board also indicated its feeling that national conventions henceforth should not be held oftener than once in three years. The Housing Committee was continued another year, to study the problem of Hq. facilities. The Board re-elected present officers and members of the Executive Committee, and rescinded its 1957 actions which limited the functions of that Committee.

The Board continued its authorizations for reimbursement of travel by SCMs, SECs and QSL Managers in furtherance of League field organization aims, commended the Hq. training aids program and urged expansion of the scope of its visual aids materials, and expressed approval of the general conduct of League contests and formulation of rules by the contest committee.

The General Manager was directed to investigate the feasibility of several proposals — discontinuing conelrad monitoring now required of amateurs, more low-power sharing of the loran bands, amateur operating privileges in 1750-1800 kc., and eliminating the requirement of A-1 or A-3 identification when using other modes of emission.

Readers will be interested in some of the things the Board did *not* do. It rejected proposals to permit Technician voice operation in 146-148 Mc.; to expand 80-, 40-, and 15-meter voice assignments; to restrict Novices to A-1 emission only; and to open a part-time information office in Washington, D. C.

The Board adopted a resolution of greeting to the IARU Congress to be held at Bad Godesburg, Germany, in July, and also instructed the Secretary, while in attendance at the 26th LMRE Annual Convention in Mexico City, to convey to the *Liga* its best wishes for a successful meeting. Resolutions of appreciation were adopted expressing thanks to the Field Engineering & Monitoring Bureau of FCC for its cooperation in amateur affairs, to vice-directors and field organization officials of the League for their fine performance during the past year, and for the outstanding communications service provided both by amateur stations in the Antarctic and the U.S. stations working with them.

1958 ARRL Field Day Rules

Annual Test for Emergency-Powered Stations, June 28-29

FIELD DAY is upon us again! Just about every amateur in the 73 ARRL Sections is already aware that June is Field Day month and that more operating fun is to be had on that one June 28-29 week end than at any other time during the year.

Working under conditions which could be encountered in an actual emergency, clubs and other organized groups will set up and operate multitransmitter stations independently of normal power facilities. Amateurs not with such teams will go into action as mobiles or unit-individual portables. Emergency-powered fixed stations, such as civil defense and amateur club stations, will compete in the Class D category. But whatever *your* method of participation, hundreds of amateurs will be scanning the bands for your signal.

The rules and entry classifications are unchanged. Pick any consecutive 24-hour period from the Field Day timetable. Once on the air call "CQ FD" on c.w. or "CQ Field Day" on phone, then give the station worked a signal report and your ARRL Section or specific location and stand by to receive like information.

Here are three examples to assist score calculations:

Example 1

Assume a 25-watt rig wholly on batteries, not originating or relaying any messages, and not having more than two operators.

40 points (40 stations worked)
X 3 (power below 30 watts)
120
X 3 (all radio equipment independent of commercial mains)
360
X 1.5 (If Class B or C and everything on batteries)
540 claimed score

Example 2

Same as Example 1 but one Field Day Message to the SEC or SCM is originated and passed in good form.

65 points (40 QSOs + 25 points for FD message)
X 9 (3 X 3 — power multiplier multiplied by independence-of-mains multiplier)

585
X 1.5 (everything on batteries)
877.5 claimed score

(Copies of all messages originated and relayed must accompany Field Day reports.)

Example 3

The Podunk Hollow Radio Club (or any group of three or more licensed operators), portable at its FD site, operates two transmitters simultaneously. Each rig runs 75 watts input and batteries or generators furnish power. One message is started in good form (25 points), 1 is received and relayed onward (2 points), and 230 stations are contacted.

257 points (230 QSOs + 25 + 2)
X 2 (power input over 30 and under 150 watts)
514
X 3 (all gear independent of mains)
1542 claimed score

(No battery multiplier for either clubs or groups.)

Clubs should get every member-owned mobile

FIELD DAY TIMETABLE

Time	Start	End
	June 28	June 29
AST	5:00 P.M.	8:00 P.M.
EST	4:00 P.M.	7:00 P.M.
CST	3:00 P.M.	6:00 P.M.
MST	2:00 P.M.	5:00 P.M.
PST	1:00 P.M.	4:00 P.M.

(Operate no more than 24 consecutive hours out of the total 27-hour period)

unit active and report their aggregate scores to ARRL. Our increased showing through individual mobile reports and club aggregate mobile scores is important because such units are considered indispensable in civil defense planning.

Convenient log forms and summary sheets are now available from the ARRL Communications Department. You may make up your own, but please remember to include starting and ending time of operating period, bands used, dates and contact times, calls of stations worked, signal reports sent and received, and locations of stations worked as well as power sources and inputs, location and call of station, number of transmitters in simultaneous operation, number of persons participating, club name (if any) and score computations. To assure listing in the final results in *QST*, mail your logs by July 26.

Read over the rules below, review the results of last year's FD in October 1957 *QST*, and try your luck at the *So You Know Your Field Day Rules* quiz in this issue. Then you should be all set to "go portable" and help make the 1958 Field Day the greatest amateur emergency exercise ever held!

Rules

1. Eligibility: The Field Day is open to all radio amateurs in the sections listed on page 6 of this issue of *QST*.

2. Object: For portable and mobile stations to work as many stations as possible; for home stations to work as many portable and mobile stations as possible.

3. Conditions of Entry: Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Contest Committee.

4. Entry Classification: All entries will be classified according to number of transmitters in simultaneous operation. They will be further classified as follows: "A," club or nonclub group portable stations; "B," unit or individual portable stations; "C," mobile stations; "D," home stations operating from emergency power; "E," home stations operating from commercial power sources. Thus a club or group running three transmitters simultaneously will be in the 3A classification, or a mobile station with one transmitter will be in the 1C classification.

Portable stations are those installed temporarily, for FD purposes, at sites away from customary fixed-station locations. Portable equipment or units must be placed under one call and the control of one license, for one entry. All control locations for equipment operating under one call must lie within a 1000-foot diameter circle.

Group participation is that portable-station work accomplished by three or more licensed operators.

Unit or individual participation is that portable-station work accomplished by either one or two licensed operators.

Mobile stations are complete installations including power source and antenna, mounted in or on vehicles and capable of being used while in normal motion. If they utilize antenna supports not normal or suitable for use during motion, installations must be classified as portable instead of mobile. Each mobile entry call must be different from any other FD station participating.

Home-Station participation is that work by fixed amateur stations not operating portable or mobile.

A transmitter used to contact one or more stations may not subsequently be used under more than one other station call during the Field Day period.

5. Field Day Period: All contacts must be made during the period indicated elsewhere in this announcement. An entry may be operated no more than 24 consecutive hours of the 27 hours available.

6. Bands: Each phone and c.w. band is regarded as a separate band. The following (and additional u.h.f.-s.h.f. bands) constitute separate bands: *A1*: 1.800-1.825 "east" or 1.975-2.000 "west," 3.5-4.0, 7.0-7.3, 14.0-14.35, 21.0-21.45, 26.96-27.23, 28.0-29.7, 50-54 and 144-148 Mc. *A2*: radioteletype and frequency-shift keying are grouped with A1, in the bands where they are allowed. *A3*: 1.800-1.825 "east" or 1.975-2.000 "west," 3.8-10, 7.2-7.3, 14.2-14.3, 21.25-21.45, 26.96-27.23, 28.5-29.7, 50-54, and 144-148 Mc. All forms of voice transmission will be grouped with A3, in the bands where they are allowed. (In Canada and Cuba, their respective phone bands apply.)

The use of more than one transmitter at one time in the same band is not allowed.

7. Exchanges: Signal reports and ARRL section (or specific location) must be exchanged in proof of contact.

8. Valid Contacts: In Class A, B and C, a valid contact is a completed exchange with any amateur station. In Classes D and E, a valid contact is a completed exchange with any station in Class A, B or C. Cross-band contacts are not allowed. Contacts by mobile stations may be made in motion or from any location(s). A station may be worked more than once only if the additional contacts are made on different bands.

9. Field Day Message: A Field Day Message is one originated by a Class A, B, or C station and addressed to the SEC or SCM (see address in *QST*, p. 6) stating the number of operators, the field location, and the number of AREC members at the Field Day station. Only one Field Day Message may be originated.

10. Scoring:

Points: Each valid contact counts 1 point.

Message Credit: Credit for handling messages may be obtained only as follows: 25 points for originating one Field Day Message to SEC or SCM. In addition, each Field Day Message received for relay will score 1 point when received by radio and 1 point when sent onward by radio. No FD Message may pass through the same station twice. There will be a deduction of 10 points for omission of handling data or for defects in form. Copies of all messages originated and relayed must accompany Field Day reports.

Multipliers:

Power: Output-stage plate input 30 watts or less: 3. Output-stage plate input between 30 and 150 watts: 2. Output-stage plate input between 150 and 1000 watts: 1. The plate input of a grounded-grid amplifier is its plate input plus the plate input to the driver stage.

Independence-of-Mains: All radio equipment independent of commercial power source: 3. All radio equipment not independent of commercial power: 1.

Battery Power: (applies to Class B and C only): 1.5. The battery capacity or size shall in all cases be adequate to permit one hour's continuous operation of the station. Charging batteries from commercial mains while batteries are connected to transmitter or receiver voids the "independence-of-mains" and "battery power" multipliers.

Multipliers do not apply to Class D and E entries.

Final Score: The final score equals the total "points" multiplied by the "power multiplier" multiplied by the "independence-of-mains" multiplier (multiplied by the "battery power" multiplier, if applicable). Where different multipliers apply during the Field Day period, points are multiplied by the multiplier in effect at the time the points were earned.

11. Club Aggregate-Mobile Scores: Entries under Class C may be combined to form a "Club Aggregate-Mobile Score." The club name must be noted on the individual reports, and the club secretary must submit a claimed aggregate score. Credits to the extent supported by the reports submitted to ARRL will be allowed. Only bona fide members of the club, residing in the club territory, may contribute to the aggregate-mobile club listing.

12. Reporting: Mail reports or entries on or before July 26. Reports must show starting and ending time of FD operating period, bands used, dates and contact times, calls of stations worked, signal reports sent and received, and ARRL sections or locations of stations worked. Reports must also show power inputs and sources of power, number of transmitters in simultaneous operation, location of station, number of persons participating, class of entry, and score computations.

W3WV Receives Navy Award

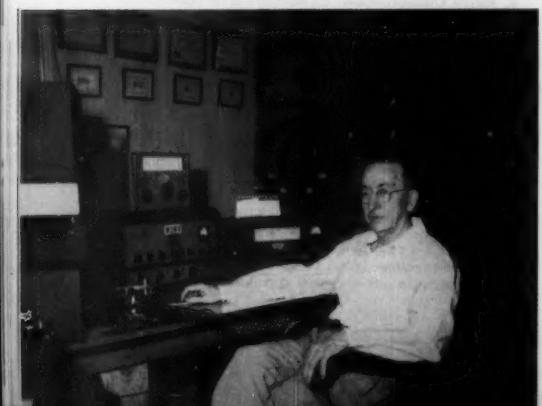
ANOTHER amateur honored by the Navy for outstanding public service is Leo Young, W3WV, who was awarded the Navy's highest civilian award — the Distinguished Civilian Service Award.

Mr. Young, who has over 40 years of Navy service, received the award for his outstanding contributions and pioneering scientific achieve-

ments in the fields of radio communication, radar, electronics identification, and radio control. He joined Naval research activities in 1917, and has played a key role in many important projects ever since. It was he who proposed the present pulse radar system and contributed several ideas basic to its success. He was awarded a commendation from the Secretary of the Navy for his pioneering achievements in radio broadcasting in 1922; the Institute of Radio Engineers' Fellow Award in 1943; and the Presidential Certificate of Merit for his achievements in radar in 1946. He is now a consultant in the Radio Division of the Naval Research Laboratory.

Radio has been his avocation as well as vocation. An active amateur since 1905, he has been prominent in ARRL activities through the years. He has two sons who are also hams — W5RVI and KB6BJ.

Leo Young, W3WV, recent recipient of the Navy's Distinguished Civilian Service Award.



A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4 1/4 by 9 1/2 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — D. W. Waterman, W1IPQ, 99 Flat Rock Rd., Easton, Conn.
W2, K2 — North Jersey DX Association, Box 55, Arlington, New Jersey.
W3, K3 — Jesse Biehner, W3KT, P.O. Box 400, Bala-Cynwyd, Pa.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Robert Stark, W5OLG, P.O. Box 261, Grapevine, Texas.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Joseph P. Vogt, W7ASG, P.O. Box 88, John Day, Oregon.
W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9 — J. F. Oberg, W9DSO, 2601 Gordon Drive, Flossmoor, Ill.
W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.
VE1 — L. F. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — George C. Goode, VE2YA, 188 Lakeview Ave., Pointe Claire, Montreal 33, Que.
VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., James, Man.
VE5 — Fred Ward VE5OP, 809 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 833 10th St. N., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 1684 Freeman Rd., Victoria, B. C.
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. Johns, Newf.
VO2 — Douglas B. Ritey, Dept. of Transport, Goose Bay, Labrador.
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namauu Dr., Honolulu, T. H.
KL7 — KL7CF, 310-10th Ave., Anchorage, Alaska.
KZ5 — Catherine Howe, KZ5KA, Box 407, Balboa, C. Z.

**IS YOURS ON FILE
WITH YOUR QSL MGR?**



V.H.F. QSO Party

June 14-15

Another ARRL V.H.F. Party, open to amateurs who can work any band or bands above 50 Mc., starts at 2:00 P.M. local standard time Saturday, June 14, and continues until 11:00 P.M. local standard time Sunday, June 15. The 33-hour period will provide a fine opportunity to work some DX states, meet new friends, and give the v.h.f. gear a pre-Field Day workout.

Just call "CQ V.H.F. QSO Party" or "CQ Contest" to get in touch with other participants, then exchange names of ARRL Sections (see page 6). Figure your score as shown in rules 4 and 5.

A certificate will be awarded to the top scorer in each ARRL Section, and special recognition will also go to Novices, Technicians, and multi-operator setups (see rule 7).

After the contest, send us a copy of your log (as shown in the sample on page 48, June 1957 *QST*). Log forms are now available free on request from the ARRL Communications Department.

Rules

1) The contest starts at 2:00 P.M. Local Standard Time, Saturday, June 14, and ends at 11:00 P.M. Local Standard Time, Sunday, June 15. All claimed contacts must fall within this period and must be on authorized amateur frequencies above 50 Mc., using permitted modes of operation.

2) Name-of-section exchanges must be acknowledged by both operators before either may claim contact point(s). A one-way exchange, confirmed, does not count; there is no fractional breakdown of the 1-, 2- or 3-point units.

3) Fixed-, portable- or mobile-station operation *under one call*, from one location only, is permitted. A transmitter used to contact one or more stations may not be used subsequently under more than one other call during the contest period.

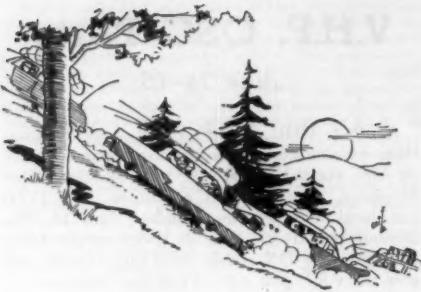
4) Scoring: 1 point for completed two-way section exchanges on 50 or 144 Mc.; 2 points for such exchanges on 220 or 420 Mc.; 3 points for such exchanges on the higher v.h.f. bands. The sum of these points will be multiplied by the number of *different* ARRL sections worked per band; i.e., those with which at least one point has been earned. Re-working sections on additional bands for extra section credits is permitted. Cross-hand work does not count. Contacts with aircraft mobile stations cannot be counted for section multipliers.

5) A contact *per band* may be counted for each station worked. Example: W2TBD (S.N.J.) works W1PHR (Conn.) on 50, 144 and 220 Mc. for complete exchanges. This gives W2TBD 4 points (1 + 1 + 2) and also 3 section-multiplier credits. (If W2TBD contacts other Connecticut stations on these bands, they do not add to his section multiplier but they do *pay off* in additional contact points.)

6) Each section multiplier requires completed exchanges with *at least* one station. The same section can provide another multiplier point only when contacted on a new v.h.f. band.

7) Awards: A certificate will be awarded to the high-scoring single-operator station in each ARRL section. In addition, the high-scoring multiple-operator station will receive a certificate in each section from which three or more valid multiple-operator entries are received. Certificates will also be given to the top Novice and Technician in each section where three or more such licensees submit logs. Award Committee decisions will be final.

8) Reports must be postmarked no later than July 2, 1958, to be eligible for awards. See the sample log on page 48, last June *QST* for correct form, or a message to Headquarters will bring printed blanks for your convenience.



So You Know Your Field Day Rules

BY PHIL SIMMONS,* W1ZDP

ONCE upon a time there was a ham named Sam who got his ticket when he was nine. Sam loved DX and contests and had 200 confirmed and three Sweepstakes awards socked away by the time he graduated from high school, first in his class. Sam was a bright boy. Because math was his forte he started studying E.E. at M.I.T., where he continued to draw straight-A grades. As a sophomore, on crisp winter evenings when the homework was done and no contests were on, Sam always curled up with a good book. *Entropy of Stochastic Processes* was one of his favorites. So were *The Stability Problem in Matrix Eigenvalue Problems and Solution of Maxwell's Equations in Cylindrical Coordinates*. Yes indeed, Sam was a very bright boy.

Came early 1957 and Sam was appointed Field Day Chairman of his club, one of those big-time

* Asst. Communications Manager, C.W., ARRL.

Here's a quiz well calculated to try the patience of any amateur who thrives on operating, be he SSer, DXer, trafficker, v.h.f. man, ten-meter phone enthusiast, contest loophole lawyer or simply plain old-fashioned ragchewer. Clubs are invited to kick the questions around at June meetings for some harmless, brain-teasing entertainment. And with FD imminent, what more appropriate time to test one's knowledge of the rules?

outfits that take the whole business most seriously. At least 50 members participated, goofing off was not tolerated, and 1000 to 2000 contacts always were made.

Genius that he was, young Sam launched his crash program. He hurriedly lined up the loftiest mountain peak in the vicinity for the site, set up operator-logger shifts, assigned people to installation and maintenance and to cooking and k.p., delegated responsibility for equipment and antennas, cranked out lists of items needed from tents and cots down to the last pencil. Old pros marveled at Sam's organizational prowess, unanimously agreed that never in club history had the advance planning been so shrewdly laid on.

Then fate lowered the boom. Shortly after Field Day a crumpled, tear-spattered letter fluttered out of an ARRL mail sack. It was from Sam. Everything had gone awry. Rain and wind brought tents and antennas down, as capacitors and resistors fizzled with frightful regularity. Three of eight transmitters switched to commercial mains after a generator conked out. Several rigs dropped from 150 to 25 watts input due to tube failures. The copy of the Field Day Message and two log sheets were lost. Despite all the grief, however, the club managed to make over 1000 valid QSOs. The reason for the weeping was that Sam — the DX and contest ace, the A student, the organizational and mathematical whiz — *didn't know how to figure the club's Field Day score!*



Sam wasn't the only one. After last year's Field Day there were some three hundred Sams who didn't know how to calculate their claimed scores or figured them incorrectly — certainly not for lack of mathematical ability because only simple addition and multiplication are involved. Others forgot to indicate transmitter inputs or whether emergency power was employed or whether they were portable or at home. Dozens furnished everything needed but the *call used*. When such essentials are omitted, letters must be written to unsnarl the foul-up and the ensuing tangle of correspondence slows the appearance of the results in *QST*. And inasmuch as Headquarters wants to process FD so as to publish the final standings as rapidly and accurately as possible, we have whomped up this little quiz.

To figure a score when beset by Sam-type complications, one must comprehend the under-

lying purposes of ARRL's June funfest, so let's review the whys and wherefores. First, it is basically an emergency preparedness drill, not a contest. It's our yearly attempt to put amateur radio's best foot forward by showing what we can do in time of flood or blizzard or any other act of God. Quivering with expectancy and with nostrils flaring, we charge out to a hilltop to demonstrate how well we can function away from home. Visitors are welcome. We are polite to representatives of the press who have written many complimentary words about our hobby. We pose blushingly (but becomingly, we hope) for newspaper photos and live telecasts. We do our best.



Now the picture should be obvious. Its very name explains why no one parked on his tailbone in the home shack earns multipliers to compete with field stations scorewise, and why Field Day is no Sweepstakes or DX Contest. All forms of portable work are encouraged through entry classes A, B, and C and the club mobile aggregate listing. To answer the following questions correctly, one must learn the definitions of "portable," "mobile," and "Field Day Message," three more major stumbling blocks. What is a "home station?" How much traffic credit is allowed and under what circumstances may it be counted toward score? What multipliers are granted for power, independence-of-mains, and batteries?

Switch to the 1958 announcement in this issue. Examine the detailed rules and the three scoring examples. Note that we must be portable on emergency power to merit the IOM multiplier. How about input? When disaster strikes might not a half-kw. provide more reliable communications than a 10-watt peanut whistle? Perhaps, but lightweight portability and power drain can be important as well. Besides, in the matter of inputs the scoring system bows to the long-recognized value of competitive incentive, hence strives to equate high and low power efforts. Without local and national competition between stations of comparable size, without new contact and score records as targets, without that bet with the club across town (loser picks up the dinner tab) and the like, Field Day — noble purpose notwithstanding — might be less popular. And what nincompoop would tamper much with a formula that has proved itself such a bang-up success for so these many years?

Let's cut the shilly-shally and get down to cases. Assume that all contacts are valid (i.e. made, logged and duly reported) and that all FD Messages are handled in proper form and copies forwarded to ARRL, *unless otherwise indicated*.

Pencils poised? Rules down pat? Wits QRV? Okay, here's the quiz:

1. KN4OKZ is one of 15 members present at Potomac Valley Radio Club's installation. Any rig he operates must run 75 watts input or less, be crystal-controlled, and stay within the authorized KN/WN band segments.

2. One-man portable W6BES/6 identifies his location as Encino, California in all contacts. As the rules require exchange of names of ARRL Sections, his final score is zero.

3. To determine input to a grounded-grid final amplifier for FD purposes, the filament power must be added to the plate power because the filament is "up in the air" for r.f.

4. No FCC regulation or FD rule would be violated should a Technician serve as logger on the 7-Mc. c.w. position at a FD setup.

5. The boys have been talking it up for weeks and Orville can scarcely wait for the big day. Then along comes Saturday and he has tired blood or Asiatic Flu or something and his temperature is 100°. The XYL issues an edict. "With that fever you're staying home, Field Day or no Field Day — and that's final!" Bitterly disappointed, Orville acquiesces, but that evening his fever subsides and he is allowed to move into the driveway with his suitcase portable. This rat's-nest sports a v.f.o.-driven 6V6 final at a smashing 7 watts plus a 58-58-56 autodyne, both of which Orville ties to his huge 5-element wide-spaced 20-meter rotary. Power comes from a small Onan. The QRM is awful on that antiquated inhaler but Orville manages to knock off 100 contacts. Fifty are FD portables, 20 are Stateside nonportables, 30 are home-station Europeans. Orville's score can be no higher than 50 points all told.

6. Right after FD W8XYZ informs the League that the Sadsack Amateur Radio Club made a 4500-point tally. There was no carbon paper at the site, no copy of the log is presently handy,





and he is much too busy to prepare one. He asks that the club's results be listed in the *QST* tabulations anyway. SARC's score will appear in the tabulations.

7. The rules do not permit club portables to utilize batteries as a power source.

8. Home stations receive neither power nor independence-of-mains multipliers.

9. Originated by home station W9RQM, this message is sent by radio to W9GIL during the FD period:

NR5 W9RQM CK7 WAUSAU WIS 2000 JUNE 28 GEORGE WOIDA W9KQB SCM AA 2103 SOUTH 9 ST AA MANITOWOC WIS BT ONE AREC MEMBER ENJOYING HIMSELF IMMENSELY 73 BT RENO W9RQM AR

It can be the equivalent of 25 contacts toward W9RQM's score.

10. Club portables sometimes can qualify for a total multiplier of 13.5.

11. Portables manned by two brassbounders sometimes can qualify for a total multiplier of 13.5.

12. A PE-99 powers all rigs while receivers, keying monitors, lights, hot plate, v.t.v.m. and soldering iron are on commercial mains. Though emergency-powered at a portable site, this group is ineligible for the independence-of-mains multiplier of 3.

13. W1DX/1 can roll up 127 QSOs and end up with a score of only 127 points.

14. An amateur operating his mobile rig from a.c. mains can qualify as a Class C entry.

15. W8QAV/Mobile appears in the final standings with 69 contacts and a score of 1971. A misprint must have been involved because W8QAV/8 could not earn such a large score with just 69 QSOs.

16. There is no limit to the number of hams that can work the transmitter of a mobile entry.

17. A club with five transmitters, four receivers, eight antennas and 37 operators can participate as a Class 6A entry.

18. *QST* credits W1EH/1 with 433 contacts and 3897 points in the one-transmitter class. It follows that W1EH/1 could not have handled any traffic whatsoever during the FD period.

19. No FD rule is violated when a club portable uses an antenna 2500 feet away from its "control location."

20. VE1OM/1 operates continuously from 6:00 P.M. AST June 28 until 8 P.M. AST June 29, 1958. Assuming that exactly ten QSOs per hour were made throughout the entire period, VE1OM/1 can be credited with 260 valid contacts.

21. This garbled message pops up at 38 La Salle Road:

NRI K4LA/4 FALLS CHURCH GA CK20 1630 PM JUNE 30 ARRL WEST HARTFORD 7 COLO BT W4TFX AND I HAVING TREMENDOUS TIME IN CLASS B NEAR WASHINGTON DC STOP BEST 73S TO THE HEADQUARTERS GANGS

BT EV BATTERY W4IA/4 AR¹

It was mailed by the last amateur receiving it after a number of relays. The above is not a Field Day Message.

22. Observing that no one has yet made 300 QSOs in the mobile category, W9BRD, W9MFY and W9VES decide to join forces and shoot for a new record. They load VES' battered Merc to the hilt and motor close to Illinois' highest point, Charles Mound. Using the call W9MFY/9, 30 watts input, batteries, and a full-wave 160-meter zepp, the trio grinds out 327 contacts. Excellent results notwithstanding, W9MFY/9 is not a valid Class C entry.

23. Timbuktu Civil Defense Radio Association has a regular club station situated in the basement of the Kappa Delta Rho frat house on campus, but "to get out better" gear is toted up to the bunkhouse on the third floor. The TCDRA team pushes no traffic but belts out 250 contacts with 15 watts input and a PE-75 supplying the juice. Their score can be no more than 250 points.

24. Battery-powered W3EIS and W4KFC start off as a bona fide Class B station using the call W3EIS/3. Input to two ARC-5 senders is held to 450 volts at 60 ma. Hot as firecrackers, Don and Vic are averaging 30 QSOs per hour until noon Sunday when visitor W3XYZ drops by for a single-handed operating fling. Alas, his fist is lousy and his logging worse and the W3EIS/3 contact rate plummets. After 70 minutes of this farce W3XYZ departs, whereupon Don and Vic — sighing with relief — happily resume. With 650 contacts and no traffic work, W3EIS & Co.'s score is 8775 points.

25. Laurel Amateur Radio Association members W1CUT, W1FXK, and W1ICP take part as individual units in Class C. CUT makes 20 contacts, FXK makes 25, and ICP makes 30, with respective inputs of 10, 40, and 175 watts. All three sign "portable one in Connecticut" and are entitled to the battery multiplier. In addition, CUT originates and passes an FD Message to ICP who subsequently relays it to FXK. No other messages were handled. LARA's mobile aggregate total is 985.5 points.

(Answers on page 158)

¹ Profound apologies to ace traffic man Ev Battey, W4IA, for this example. Any resemblance to a message Ev may have originated is purely coincidental.



Hints and Kinks

For the Experimenter



IMPROVED CONTROL CIRCUITS FOR THE DX-35

THE accompanying diagram, Fig. 1, shows how a d.p.s.t. toggle switch can be used to advantage in the send-receive circuit of a Heathkit type DX-35 transmitter. Once the simple modification involving mounting and wiring the switch is completed, it will provide *one-switch* control of the transmitter plate voltage and any external relays that may be used for antenna changeover, receiver muting, etc.

S_{1A} of the new arrangement provides on-off switching of 115 volts a.c. that has been piped over to previously unused terminals 5 and 6 of the auxiliary power socket. This voltage may be cabled out to the aforementioned relays. S_{1B} of the modified circuit is connected in series with the on-off contacts of the "Operation" switch for the transmitter. Thus, S_1 provides simultaneous control of the transmitter, the antenna relay, and the receiver muting circuit.

In making the modification, first remove the key jack from the front panel of the transmitter. Drill a hole in the rear apron of the chassis, in between the coaxial receptacle and the microphone jack, and remount the key jack. The hole left vacant at the front of the rig should now be enlarged slightly to accommodate the toggle switch, S_1 .

Next, replace the lead between Terminal 6 of the operation switch and ground with a pair of leads which terminate at S_{1B} as shown in Fig. 1. The second wire originally connected to Terminal 6 of the operation switch (the one that goes to the slide switch) should be disconnected at Terminal 6 and then returned directly to ground.

Pin 11 or 12 of the operation switch is connected to the a.c. line cord at the 4-terminal tie-point strip identified as part "AA" on Heathkit pictorial drawings. Using an ohmmeter, or other means, determine which switch pin is so connected, and then run a wire from this pin to one terminal of S_{1A} . Connect the other side of S_{1A} to

Pin 5 of the auxiliary power socket, and then connect Pin 6 of the socket to Terminal 1 of lug strip "AA." This completes the wiring except for adding by-pass capacitors, C_1 and C_2 in Fig. 1, to Pins 5 and 6 of the power socket. These capacitors should be similar to those already connected to other terminals of the auxiliary power socket.

The filaments of the transmitter are still turned on and off with the operation switch after S_1 has been installed. The operation switch is set at either the c.w. or the phone position depending on the mode of transmission and is not used again until the transmitter is turned off. Turning the toggle on will apply high voltage — with operation switch on either phone or c.w. — and will activate the external antenna or other relays.

— *Reagin Warren, W4RVH*

When using a v.f.o. — DX-35 setup it is necessary to have the carrier on the air when zeroing in on the desired frequency. This forces the operator to sweep the band with a carrier and causes receiver blocking. The number two fault is minor in comparison. It is just that in changing back and forth from send to receive, the usual combination of switches on the transmitter and receiver have to be operated quickly and in the proper direction and sequence. Both of these faults are easily corrected by a simple modification without impairing the operation or basic design of the set. In fact, with the modification in effect, a shorting loop shoved into Pins 5 and 6 of the auxiliary socket leaves the operating circuits set up as described in the instruction manual.

What do we need for the big job? One 20,000-ohm 10-watt resistor, three .001- μ f. disk ceramic by-pass capacitors, fifteen inches or so of hookup wire and about 30 minutes. To accomplish the modification, refer to the pictorials in the instruction manual and perform the following steps:

1) Remove the two white wires on Terminal 6 of the operation switch, solder together and tuck out of the way. No insulation is necessary because

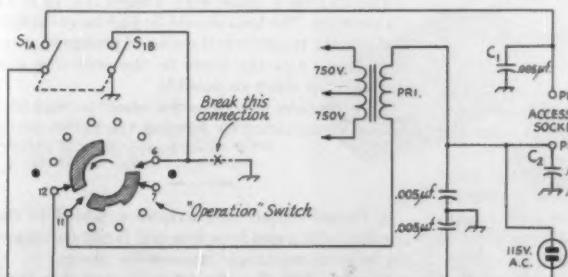


Fig. 1—Circuit of W4RVH's improved control circuit for the DX-35 transmitter. C_1 and C_2 (see text) must be rated for 115 volts a.c. S_1 is a d.p.s.t. toggle switch.

they are grounded about three inches away.

2) Remove the connecting wire between Terminals HH-1 and E-1.

3) Connect a piece of wire from Terminal 6 of the operation switch (S) to Terminal HH-1 (S).

4) Move the transformer high-voltage center-tap lead from FF-5 to FF-3 (S).

5) Move the lead of the 20K 10-watt resistor from FF-4 to FF-5 (NS).

6) Connect one lead of the additional 20K 10-watt resistor to FF-4 (NS) and the other lead to F-3 (NS).

7) Connect a wire from FF-4 (S) to F-6 (NS).

8) Connect a wire from FF-5 (S) to F-5 (NS).

9) Connect one lead of a 0.001 disk ceramic capacitor to F-3 (S) and the other lead to the nearest ground point (S).

10) Connect one lead of a 0.001 disk ceramic capacitor to F-5 (S) and the other lead to the nearest ground point (S).

11) Connect one lead of a 0.001 disk ceramic capacitor to F-6 (S) and the other lead to the nearest ground point (S).

With the above connections made, Terminals 5 and 6 on the auxiliary socket connect to the remote operating switch if one is used for push-to-talk operation. If such a switch is not used, 5 and 6 must be jumpered with a short piece of wire. The addition of a s.p.d.t. switch to any v.f.o. used with the set now will allow the v.f.o. to be turned on without turning on the transmitter since B+ to operate it appears on Terminal 3 of the auxiliary socket regardless of the position of the operation switch.

— *Glen R. Jackman, W3GZP*

SOLDERING AND SOLDERING ACCESSORIES

ONE of the petty annoyances in coil winding with cotton and silk covered wire is frayed insulation. A wire having frayed insulation is difficult to poke through a hole in a coil form, and loose and rumpled insulation certainly does not enhance the appearance of the finished product.

By melting solder directly over the point where the wire is to be cut, sufficient resin will be saturated into the insulation to hold it in place while the cutting, dressing, tinning and soldering operations are performed.

This trick is also very effective when it is necessary to tap a length of insulated wire. The results will not present the appearance of mice having gnawed at the covering!

— *Bill Fishback, W1IKU*

The problem: Field repair of a broken receiving antenna without having access to 115 volts a.c. for a soldering iron.

Solution: After cleaning the ends of the wires and looping them together, the joint was wrapped with solder that had been flattened with a hammer. The solder was then melted with a small torch, in this case an ordinary match!

Not the most highly recommended method of

making an electrical joint, but certainly one worth remembering when an emergency arises.

— *Robert Carpenter*

One simple method of preventing damage to a polystyrene coil form during soldering is to insert the form in an inexpensive wafer socket before applying heat from the iron. The socket does carry off some of the heat that would otherwise reach the prongs, but it makes up for this by maintaining the prongs in perfect alignment.

Here at W0SGG, we mount the socket/sockets in a sheet of material that can be clamped in the bench vise, thus taking care of the problem of holding the coil form while working on it.

— *Otto Woolley, W0SGG*

Here is another method of protecting polystyrene coil forms against heat.

When ready to solder, stand the form on its end with the prongs sticking up. Wrap a piece of half-inch masking tape around the form with its uppermost edge protruding up over the prong end by approximately $\frac{1}{16}$ inch. Using a teaspoon, fill the walled-in area around the prongs with water.

You can now apply heat and solder to the prongs without too much danger of the form melting and the prongs becoming misaligned.

— *Alexander McGlashan, K2GIN*

When removing the base from a plug-in coil, tube, or multiwire connector, it is always helpful if the prongs involved can all be unsoldered at the same time. Use of a homemade ring tip such as illustrated in Fig. 2 will allow all prongs to be

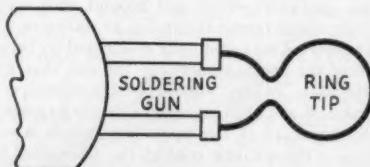


Fig. 2—Illustration of the ring tip used by W1MWO for simultaneously unsoldering a number of base prongs.

heated simultaneously.

The ring tip is made with Tinned No. 12 or 14 copper wire. The loop should be just large enough in diameter to encircle the ring of prongs that require heat, and the leads to the soldering gun should be as short as possible.

This method can also be used to unsolder canned components by forming the tip properly.

— *Harry Star, W1MWO*

A tinned copper wire extension added to the regular tip of a gun type iron will facilitate soldering in some seemingly inaccessible places.

Clean and tin the wire extension and then bend

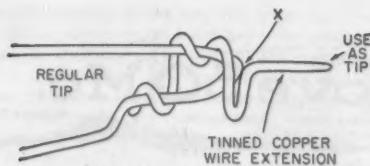


Fig. 3—Sketch showing how W5CYF extends the usefulness of a soldering gun by extending the length of the tip.

it tightly around the main tip as shown in Fig. 3. Make very sure that the tips are clean and in good contact at point marked X, and add a little solder at this junction to assure maximum transfer of heat.

The extension may now be bent into a shape best suited for the job. Of course, the wire will not transfer enough heat for heavy soldering operations, but it does permit doing many light jobs located in hard-to-get-at spots.

— *Edwin B. Robertson, W5CYF*

The accompanying photograph, Fig. 4, is an open-for-inspection view of a soldering aid that has seen factory use for the past four years. The aid has so speeded soldering operations that we simply litter the bench with them so that whenever we reach for solder — it's there.

The aid consists of small diameter solder wound on the film spool of a 35 mm. film cassette. Up to four layers of solder may be wound if a 36-exposure cassette is used. When reassembling the unit, make certain that the solder feeds through the velvet lined slot properly by aligning the slot with the solder lead. Otherwise, the solder will not release easily. A small hole is drilled in the spool to hold the starting end for ease of winding.

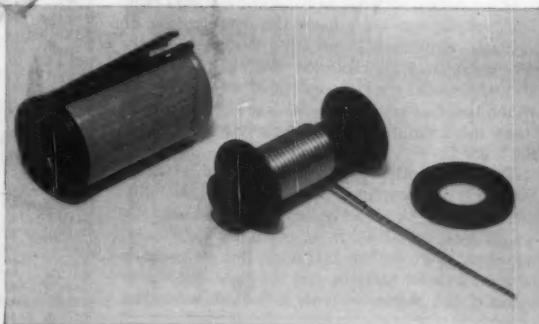
Cassettes may be obtained from some film processing companies at no cost because they are not normally reused after the film is developed.

Incidentally, Kester Company puts out an excellent booklet on the subject of soldering. A copy makes good reading for anyone interested in the proper application of solder.

— *James R. Grace, W6OJS*

Editor's Note: Newcomers interested in learning

Fig. 4—An open-for-inspection view of the soldering aid made from a 35 mm. film cassette. W6OJS gives construction details in the text.



about proper soldering methods should also review "How's Your Soldering?", *QST*, September, 1957.

A handy *unsoldering* accessory is a tool made from an old hacksaw blade. The surplus scavenger will find it practically indispensable and, if he has a power grinder available, it can be made in a few minutes.

The shape of the *unsoldering aid* is shown in Fig. 5. Remove the teeth from the blade while the grinder is turning over and, of course, make the tool long enough to permit a good grip. Adhesive tape of one type or another may be



Fig. 5—An illustration of the unsoldering aid suggested by W7JJP. The tool is made from a hacksaw blade.

used to cover the handle part, but do not cover up the hole at the grip end. Just remember to use that hole to good advantage — slip it over a nail driven high in the wall — if you have any junior ops that can creep into the workshop!

— *Rudy Erickson, W7JJP*

SAVE THAT OLD MASCARA BRUSH

THE XYL's old mascara brush, when dipped in a little carbon tett, is ideal for cleaning relay contacts, volume controls, switch contacts and other radio parts.

— *Ronald Litt, K2KMA*

REMOVING GUY WIRE AND GROUND STAKES

WHEN you next run across a guy wire or ground stake that won't pull up after a few mighty heaves, put the automobile bumper jack to work. As long as the stake or rod has a clamp or other surface to which force may be exerted, it is fairly certain that it will move after a few strokes on the jack handle.

— *Harry M. Engwicht, W6HC*



CONDUCTED BY EDWARD P. TILTON,* WIHDQ

WILL the 2540-mile 144-Mc. record ever be broken?

When the previous record of 1400 miles was set back in 1950, it appeared highly unlikely that it would ever be extended by any great amount. The W5QNL-W6ZL QSO, like others made at the same time over slightly shorter distances, was deemed to have been the result of very dense *E*-layer ionization. Going much over 1400 miles by this means seems a remote possibility, and double-hop propagation (which might mean a haul of 2500 miles or more) would involve a fantastic combination of perseverance and good luck. Tropospheric propagation? We'd had some out to 1200 miles or more, but nobody gave it a chance to go much farther.

Moonbounce techniques were then in their infancy. They've advanced some since, but we're still a long way from substantial success in that department, at least within the amateur power limit. A newer technique, ionospheric scatter, may just work at 144 Mc., though it is far more promising at 50. Meteor scatter can provide communication of sorts, but like ionospheric scatter and sporadic-*E* skip, it appears to be limited to something under 1500 miles.

That tropospheric propagation, first-known of all v.h.f. DX phenomena, could provide communication over distances of record proportions was hardly suspected until July 8 of last year, when W6NLZ and KH6UK achieved their first success over the Pacific from the West Coast to Hawaii. But they did it twice, proving that it was no fluke. Can we do better? What will it take, if so?

People who should know say that the tropospheric conditions that made possible these 2540-mile QSOs can extend even farther than Hawaii — but where west of Oahu would you find another KH6UK? And as for the Mainland end, few 2-meter operators have the combination of location, equipment, operating savvy and perseverance that characterize W6NLZ. Conceivably the record could be extended a few miles at either end, but what we're talking about is something more significant than a mere stretching of the record.

There are other places in the world where favorable tropospheric conditions occasionally prevail over very considerable distances. We would look for these most often on long over-water paths in the low latitudes, but coincidence of good 2-meter stations and the right conditions seems a slim chance at best, in latitudes near the

equator. UT3AE, Madeira Islands, has expressed interest in trying, but he may be low on power. A remote chance, but perhaps one most



1 W6ZJB	11 W2IDZ	21 K6EDX	31 K6GQG
2 W6BJV	12 WILL	22 W5SFW	32 W7FFE
3 W6CJS	13 W6DZM	23 W9OORE	33 W6PP
4 W6AJG	14 W6HWV	24 W9ALU	34 W6BJI
5 W6ZHL	15 W6WKB	25 W6CMS	35 W2MEU
6 W6OCA	16 W6SMJ	26 W6MVG	36 W1CLS
7 W6OB	17 W6OGW	27 W6CNCM	37 W6PUZ
8 W6INI	18 W6TERA	28 W1VNH	38 W7ILL
9 W1HDQ	19 W3OJU	29 W6OOLY	
10 W6MJD	20 W6TMI	30 W7HEA	

W1FOS	47 W4AKX	42 W7FIV	41 K6JJA	47
W1CGY	46 W4RFR	42 W7CAM	40 W6JBL	46
W1LSN	46 K4DNG	41 W7MKW	40 W6JOL	46
W1AEP	46 W4OXC	41 W7YJE	38 W6USQ	45
W1SUZ	46 W4BZQ	41 W7QDJ	34 W6KY	45
W1RFU	45 K4GYZ	41 W7UFB	33 W6QVZ	45
W1ELP	44 W4FNR	40	W6FZ	44
W1KHL	44		W6YJF	44
W1LGE	42 W5VY	48 W8NOH	47 W6RQ	44
W1FZ	42 W5LFQ	47 W8QJN	46 W6BTG	43
W1FVZ	41 W5GNQ	46 W8SQU	46 K6GKR	43
W1IKO	40 W5FSC	45 W8HXT	46 W6JHS	43
W1CLH	40 W5ONS	45 W8NQD	45 W6PI	43
W2RGV	44 W5JLY	45 W8UZ	45 K6DXS	43
W2JNS	47 W5ML	44 W8RFW	45 W6WNU	42
W2AMJ	46 W5EXZ	43 W8LPD	44 K6CLJ	41
W2BYM	45 W5V	43 W8HJR	44 W6PKD	41
W2FJH	46 W5FXN	43 K8ACC	43 K6AJK	40
K2ZKA	45 W5JME	42 W8ESZ	42	
K2ZHV	45 W5CVW	41 K8CIC	42 VE3AET	47
K2AXQ	45 W5FAL	41 W8EVH	42 VE7CN	41
K2ITQ	43 W5HEZ	41 W8YLS	41 VE1EF	38
K2ITP	43 W5BXA	41 W8INQ	40 VE3AIB	37
K2LTW	41 K5ABW	40	EL2W	35
W2ORA	40 W6WNN	48 W9BRN	48 VE3BX	33
W2UHN	48 W6UXN	48 W9ZHB	48 VE3BHQ	32
W3TIF	47 W6BAZ	47 W9QUV	48 VE1QY	32
W3KKN	45 W6JCA	47 W9ZP	47 VE1PO	31
W3KMV	45 W6JKN	47 W9RQM	47 VE2AOM	31
W3TRUE	42 W6ANN	46 W9QKM	47 VE3DER	31
W3NKM	41 W6NDP	45 W9FP	47 SM7ZN	29
W3MQU	41 W6ABN	45 W9DSP	46 CO2ZX	27
W3MXW	41 K6GTC	45 W9AAG	46 XE1GE	27
W3OTC	41 K6RNQ	43 W9UIA	45 VE1WL	28
W3FPH	40 W6GCG	43 W9UNS	45 P2IAE	26
W3LFC	40 K6HYI	43 W9MHP	43 SM6ANR	24
W6NIT	42 W6WHT	43 W9SWH	43 SM6BTT	23
W6MHP	42 W6NIT	42 W9MHP	43 VE1ZR	23
W6EJQ	47 W6IWS	41 W9KLR	43 VE3OJ	22
W4UICH	47 W6CAN	40 K6EID	43 C06WW	21
W4UMF	47 K6ERO	40 W9JCI	42 LA9T	20
W4FBH	46 W6BWG	40 W9MHP	42 VE4HS	20
K4DJO	46	40 W9SWH	42 KH6UK	17
W4EOR	47 W7BOM	47 W9EPT	41 VQ2PL	16
W4AZC	45 W6YD	47 W9IMG	41 JA1AUF	16
W4ALNG	45 W7INX	47	LU7MA	10
W4CPZ	45 W7ACD	46 W9QIN	47 JA8BU	14
W4FLW	45 W7FDJ	46 W9NFM	47 ZH2JV	12
W4MS	44 W7JPA	44 W9TKX	47 JA1AAT	12
K4HOB	44 W7JRG	44 W9KYF	47	
W4QN	44 W7BOC	42 W9ZTW	47	

* V.H.F. Editor, *QST*.

worth bearing down on, lies over the North Atlantic. Here we at least have the stations, if not the conditions. Do we have the operators?

A transatlantic 2-meter QSO won't just happen, because a few tries are made, now and then. If it ever comes off, it will probably be the result of intensive long-term effort like that made by KH6UK and W6NLZ. There will be schedules, kept religiously and at all hours. There will be the ultimate in equipment, within amateur limits, at both ends. And there will also be phenomenal good luck!

At least a few stations have setups that offer some hope of success. At this side of the Atlantic there are plenty of kilowatts and big antennas. Presumably there are also operators — and probably these are most important. In Europe most countries have power limits that are discouraging, but some special IGY authorizations may help out. We know that at least one British station, GB3IGY, has a 1-kw. authorization on a temporary basis, an excellent location and a first-class operator, G5KW. From PA9AFN, now living in this country, we learn that PE1PL, a laboratory station operated by a group of people interested in propagation experiments, will soon have a high-powered 144-Mc. station on the air. They have a fine dunes location near The Hague, with a view out over the North Sea. And in Germany, DL4WW, well known to American 2-meter enthusiasts as W3YHI, is on with the legal power limit, 500 watts.

There are undoubtedly many others who are eager to work on the possibility of pushing a 2-meter signal across the Atlantic. The International V.H.F. Society tried it some years ago, and they could very likely be talked into giving it another go. A spot on the Irish Coast might be a very favorable site from which to try, too. The main thing would seem to be to *try*, and right now is the time to start.

50-Mc. DX News

Being in between the *F₂* and *E* seasons as we write, DX news on 6 is a bit light this month. There was little worldwide DX activity after the first half of April, and as far as U.S. 6-meter men were concerned this was confined to work between California and Australia and New Zealand. There were a few smatterings of South American DX there and elsewhere, but mostly the 6-meter band was getting set for its early summer binge of sporadic-*E*.

A new country-to-country first was made April 5 when ZS6UR worked HB9BZ at 1206 to 1215 GMT. They were in contact again from 1230 to 1256, and from that time to 1300, ZS6UR worked HB9QQ. Our thanks to K2IRK, W8BXM and ZS6TB for relaying this information, via a lower band.

If you haven't worked Northern Rhodesia by now, the chances are slim that you will catch it on 50 Mc. for a long time to come. Peter Lowth, VQ2PL, the only amateur in that country known to have operated on 50 Mc., will be in Bulawayo, Southern Rhodesia, by the time this appears in print. A veteran of 50-Mc. DX through two sunspot cycles, Peter made a fine contribution to the advancement of the 6-meter cause. He was one of the few African operators to work into Europe on 50 Mc. in 1947, and when the first breakthrough to North America came in 1957, VQ2PL was in there. He worked 18 states in W2, 3, 4, 5, 6, 8, 9 and 9. We wish you luck as a ZE, Peter, but let's hope you get back to VQ2 soon!

West Coast stations had a fine time of it with the ZLs and VKs through March and early April. The last DX report we have is from W6BAZ, Santa Rosa, who says the

band was open to South America the 15th and to New Zealand the 16th. An interesting summary of Australian work comes from W. G. Francis, East Newborough, Victoria. He says that all Australian states are active on 6, the interest building up quickly with the official permission to

2-METER STANDINGS

States	Areas	U. S. Miles	States	Areas	U. S. Miles
WIREZ	28	8 1080	W5KTD	10	4 760
W1AZK	23	7 1205	W5NDE	8	3 520
W1KCS	22	7 1150	W5PEK	8	2 580
W1RFU	22	7 1120	W5Y	7	3 1200
W1V	21	6 1130	W6NLZ	9	3 2540
W1FZJ	21	6 1150	W6RHZ	4	2 360
W1OAX	21	6 800	W6WZL	8	4 1380
W1HDQ	20	6 1020	W6DNG	8	3 1030
W1MMN	19	6 800	W6AJF	5	2 640
W1I2Y	17	6 750	W6RZ	4	2 360
W1Z	17	5 680	W6WZL	4	3 1390
W1A1A	17	5 690	W6LZ	3	2 1400
W1ZJQ	17	6 800	W6BAZ	3	2 400
W1PCHR	16	6 780	W6MMU	3	2 388
W1BCN	16	5 650	W6ORS	3	2 365
W1KHL	16	5 540	W6LSB	2	2 360
W2NLY	34	8 1390	W7YMP	11	5 1280
W2CXY	34	8 1200	W7LEE	6	3 1020
W20RI	34	8 1050	W7JRG	4	3 1040
W2AZL	28	8 1050	W7LHL	4	2 1050
W2GQL	25	7 950	W7JIP	4	2 900
K2IBR	24	7 1060	W7JU	4	2 353
W2FLV	23	7 1080	W7Y2U	3	2 240
K2HOD	23	7 950	W8KAY	36	8 1020
W2DWJ	23	6 720	W8WVX	35	8 1200
W20PQ	22	7 1050	W8LOF	31	8 1060
W28MX	22	6 905	W8EMH	31	8 1000
W2AMJ	21	6 960	W8WV	30	8 1000
W2P	21	6 800	W8SG	30	8 100
K3CEH	21	8 910	W8PT	29	8 985
K2IJX	21	6 925	W8WRN	28	8 680
W2CBB	21	6 800	W8SRW	27	7 550
W2LWI	20	6 700	W8JWV	25	8 940
W2AOC	20	6 770	W8LWV	25	8 800
W2PAF	20	6 880	W8LWD	25	8 750
W2WZG	19	7 720	W8LPD	25	8 720
W2UTH	19	7 880	W8DX	25	8 720
W2AZP	19	7 650	W8EHW	25	8 860
W2RGV	19	6 720	W8BAX	23	8 675
W2LHI	18	7 620	W8SLC	20	7 610
K2RLG	17	6 910	W8NOH	19	7 650
W2SHT	16	6 650	W8CZV	17	7 970
W2PCQ	16	5 650	W8RWW	17	7 630
W3RUE	30	8 950	W9KLR	37	8 1160
W3BGT	28	8 740	W9WOK	32	9 1050
W3TDF	27	8 880	W9GAB	29	8 1075
W3P	27	7 1020	W9AGC	27	8 950
W38Q	27	7 550	W9RHM	27	8 550
W31BH	23	7 650	W9ZIH	27	8 630
W3EPH	21	8 —	W9UCH	27	8 750
W3KCA	21	7 —	W9FVJ	26	8 850
W3LNA	20	7 720	W9EPC	26	8 820
W3LZD	20	7 725	W9ZEH	25	8 760
W3W	19	8 740	W9WIX	24	7 725
W3NKM	19	8 660	W9BPV	22	7 1000
W3BNC	18	7 750	W9UED	22	7 960
W4HJQ	34	8 1140	W9KPS	22	7 690
W4HHK	33	9 1280	W9PBP	20	8 820
W4LW	29	8 1100	W9MUD	19	7 640
W4LW	27	8 1100	W9L	19	6 640
W4UMF	27	8 1110	W9KDP	18	8 725
W4MKJ	24	8 725	W9ALU	18	7 800
W4JCJ	22	6 660	W9WJX	18	6 720
W4EQM	21	8 900	W9MBL	16	7 660
W4DPU	20	6 675	W9DDG	16	6 700
W4DPU	19	7 720	W9JIY	16	7 560
W4TLV	18	1000	W9LEE	15	6 720
W4JFV	18	7 850	W9DSP	15	6 760
W4IKZ	18	6 720	W0IHD	27	7 890
W4VLA	17	7 825	W9GUD	27	7 1065
W4WNH	17	7 750	K9DOK	28	8 920
K4EWS	17	6 660	W9PFB	21	8 1050
W4LW	19	7 720	W9T	20	8 1000
W4CLY	15	6 720	W9SMJ	20	7 1000
W2BHS/4	14	7 650	W9INI	20	6 830
W4ZBU	14	5 800	W9RUF	19	7 700
W4TCR	14	5 720	W9UOP	18	6 6
W4SP	13	5 680	W9ONQ	16	6 1000
W4MDA	13	5 650	W9WJZ	15	6 825
W4KCQ	10	4 860	W9USG	14	6 750
W4LNG	9	4 800	W9IF	14	5 5
W4G1S	9	2 335	W9OAC	14	5 725
W5RCI	33	9 1215	W9RYG	14	5 600
W5DFU	25	9 1300	W9MVG	13	5 700
W5AJG	22	8 1280	W9TJF	13	5 —
W5JWL	18	6 1150	W9IC	14	2 950
W5LPG	16	6 1000	VE3DIR	26	8 915
W5VKH	15	5 720	VE3AIB	26	7 910
W5MMW	14	5 700	VE3BQN	17	7 790
W5W	14	5 700	VE3BQH	17	7 890
W5PSG	12	5 1390	VE2AAQ	13	7 800
W5ABN	12	5 780	VE3BPN	13	6 715
W5PZ	12	5 1255	VE2AOK	12	5 550
W5QNL	10	5 1400	VE1QY	11	4 900
W5CVW	10	5 1180	VE7FJ	12	1 365
W5SSWV	10	3 600	KH6UK	1	2 2540

use the 6-meter band again, beginning Oct. 8. JAs were heard on 50 Mc. last July, and some crossband contacts were made 28-50 and even 56-50, before the 50-Mc. band was reopened for the duration of the IGY. VKs also may work 56 to 60 Mc., but not many have done so, understandably, since October. VK4NG, Rockhampton, made the first JA contacts two-way Oct. 9, and in the next 15 days worked 151 JAs in all call areas except JA8, which was worked in February.

VK6BE was the first Western Australian station to work into Japan, getting through in early March. VK3ALZ and VK3PG made the first JA contacts from their area Feb. 10. VK8 MT MK RO QR EF and ZAW made the first VK5-JA contacts Feb. 2. VK7AB, Tasmania, made it in January, with JA1AXE. Through the whole summer (winter to us who are north of the equator) VK3s in the Melbourne area could hear VK4s in Queensland, to the north, working JAs, but nothing could be heard of the DX until February. Sporadic-E work was done with ZLs during the Christmas season, and many interstate aurora contacts were made Feb. 11.

Via W2LKW we have a report from VK9KT, Macquarie Island, to the effect that he operates on 50.19 Mc. at 0200, 0500, 1000 and 1100 GMT, Saturdays and Sundays. He heard W6UQ?, San Fernando Valley, Sunday, March 30, at 0149 GMT. A project scheduled for the latter part of June involves sending aloft a 50-Mc.-equipped balloon, which is expected to reach 60,000 to 70,000 feet. More information on this can be obtained from VK9KT on 2.12 Mc. George is on almost daily, beginning at 0100 EST.

K6RNQ, Oakland, Cal., has made a 50-Mc. ZL WAS, and he believes that this feat, completed in March, may have been the first from this country. Bob found the band open to New Zealand Feb. 1, 7, 20, 21, 22, 23, 28, and 19 days in March, and on April 2. He worked VK4NG HD ZAZ and ZBF on March 15, and VK4XJ March 20.

The first VK-W 50-Mc. QSO, so far as is known, was made March 15 by VK4NG and W6BJI, at 1622 PST. The band opened again the same day, around 2050, and VK4NG worked K6ERG, K6PXT, K6RNQ, W6RLB, K6MMT and W6WWB between them and 2130. The lateness of this second session points to TE propagation. VK4NG reports that JAs were in during all this time. He also heard W6CNM, Grand Junction, Colo., and two W7s in Salt Lake City, but was unable to break through the W6 QRM these fellows were experiencing.

"Record, record, who's got the record?" With 50-Mc. DX reaching out to almost exactly half-way around the world, it is not easy to sort out the record holders these days. For some time, we have recognized LU3EX and JA6FR as co-holders, their distance checking out (by our methods) at almost exactly 12,000 miles. But the Brazilian IARU Society, LABRE, claims PY2AXX and JA6FR as the most widely-separated 6-meter stations to have made contact. Now, to confuse the issue further, JA1AN, who coordinates v.h.f. activities for JARL, reports a "new record" contact between JA3EK and PY3BW, made on March 16. When the bearings in our slide rule cool down we'll have to come up with an answer. The irony of it is that U.S. stations are not likely ever to be involved in this controversy again, Japan and South America being situated not only

half a world apart, but also in the two spots on the earth's surface that seem most blessed with high F_2 m.u.f. and transequatorial scatter!

If there is transatlantic 50-Mc. DX next fall we should have at least one new country to work. Word has just been received from OH9NC that the Finnish Society, SRAL, and the licensing authority have announced that Finnish amateurs are permitted to use 50 to 54 Mc. in the period May 1 through December 31, 1958. Sam says he will be on with s.s.b. on the low edge, probably with a pair of 4X150s.

420 Mc. and Up

Consistent activity on 432 Mc. is reported by W8JLQ, Toledo, Ohio. Howard supplies the following list of stations and equipment: W8HRC, Detroit — 2C39 final, 18 watts output, 432.19 Mc., phone and c.w. Antenna: 24 elements, driven, with screen reflector. W8RQI, Toledo — 5894 final, 15 watts output, 432.66 Mc., phone and c.w. Antenna: 96-element collinear. W8JLQ, Toledo — 2C39 tripler driving 2C39 final, 18 watts output, 432.68 Mc., phone and c.w. Antenna: 96 — element collinear. W8TYY, Columbus — 5894 final, 15 watts output, 432.32 Mc., phone and c.w. Antenna: 15-element long Yagi. These stations are active nightly.

Others operating two to four nights per week include: K8AIY, Detroit — 5894, 15 watts output, 432.15 Mc. with 15-element long Yagi. W8UCT, Detroit — 2C39, 10 watts output, 432.3 Mc., with 24-element collinear. W8RLT, Detroit — 4X150, 50 watts input, 432.57 Mc., 24 elements driven, with screen reflector. W8DAU, Columbus — 4X250B, 432.45 Mc., phone and c.w., 13-element Yagi.

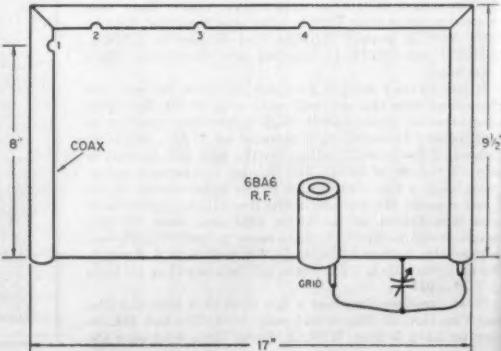
Heard occasionally are W8DX, Detroit, with a 4X150 on 432.08 Mc., feeding a 45-element stacked-Yagi array, and W8HBB, Detroit, with a 2C39 on 432.12 Mc. In the works: K8DWW, Detroit, W8VCO and W8UST, Toledo, W8HCC, Sandusky, and W8VOZ, Van Buren.

Amateurs of Southern California who are interested in microwave communication will want to take in a special meeting of the San Bernardino Microwave Society. A Symposium on microwave communication will be held, which will include a two-hour session covering past and present progress in this field. Speakers will discuss general microwave theory and constructional details of equipment currently in use, much of which has been or will be the subject of QST articles by members of the SBMS. Talks will include slides and demonstrations. Date: June 5. Time: 7:30 P.M. Place: Chaffee College Annex (A-15), Euclid Ave., Ontario, Calif.

Coaxial Tank for 50 Mc.

When W4IKK moved to Signal Mountain, Tenn., he got a fine v.h.f. location, but along with it he took on a formidable overloading problem. Mountain tops have a way of being well supplied with v.h.f. stations of various services these days. Bill has Channels 3 and 9 a mile to the north. Channel 12 1½ miles south, and a gas company f.m. station on 49.6 Mc. close by. Each of these is bad enough, but together, and in combination with strong amateur signals, they create all kinds of spurious responses in a conventional 50-Mc. converter.

Coaxial tank circuit used on 50 Mc. by W4IKK. U shape was employed to permit mounting on a standard chassis.



Originally the W4IKK converter had a 6BK7A cascode stage ahead of a 6BA6 r.f. with conventional circuits. Taking out the cascode, and installing a coaxial tank in the 6BA6 grid circuit cost a few db. in noise figure, but there is still some 3 db. of antenna noise left, so the sensitivity is more than adequate. Actually, getting rid of most of the overloading effects improved the effective sensitivity of the converter noticeably.

The coaxial tank was made from $\frac{1}{2}$ -inch copper coaxial line of the rigid variety having a $\frac{3}{4}$ -inch inner conductor supported on ceramic beads. These dimensions are not particularly critical, and it would be no great problem to make your own, if you don't have access to the ready-made variety. Bill started with 36 inches of the coax, and cut it at $9\frac{1}{2}$ inches to make the right-angle bends shown in the drawing. The reason for these was to get the tank onto a standard 17-inch chassis.

Tapping a 50-ohm antenna link onto the tank at the various holes shown gave the following results: Hole 1 — good noise figure over about 800 kc., and usable to $1\frac{1}{2}$ Mc. Hole 2, 12 inches from the shorted end — best noise figure of any point, and good over about 2 Mc. Optimum n.f. held over 1 Mc. Holes 3 and 4, 16 and 20 inches from the shorted end, gave progressively poorer noise figures and greater band width, with less effective rejection of spurious signals. The tank is tunable from the front of the converter, so the selectivity is no problem. Bill feels that connection at hole 1 or hole 2 is O.K., depending on the severity of the interference problem, with hole 2 being optimum for most users.

Prior to the installation of the coaxial tank, reception was marred by the TV signals beating in various low-frequency signals, and there was f.m. hash at an S8 level, peaking around 50.1 Mc. When 50-Mc. signals reached levels over about 9-plus-30 they had TV birdies on either side. West Coast signals often reached or exceeded this overload level during F_2 openings. With the coaxial tank installed (and the cascode stage eliminated) there is very little trouble of any kind. The noise generator says the converter noise figure is somewhat higher than when the cascode was used, but reception of weak signals is vastly improved.

Clubs and Nets

Should a v.h.f. net operate if the band to be used is open for DX at the time the net is scheduled to convene? This question often comes up, and it puts the NCS on the spot. Somebody is sure to object, whichever way he decides. As we see it, the answer depends a good deal on the nature of the net. If the operation is a RACES drill, there should be no question. It should take place on time, regardless of conditions. In fact, it is important that such a net know its limitations under QRM conditions, and it is the duty of each member to do his part.

If the net is a formal one, devoted to emergency work and preparedness for same, it probably should carry through on schedule, too, particularly if the operating frequency is (as it should be) outside the part of the band in which most DX is worked.

If the net is informal, devoted mainly to general information exchange, we feel that it is up to the members of the net themselves to decide whether they want to stay with the net. A decision on policy should be made by vote of participants, so that the NCS will know what to do. If the decision is to cancel net operation during DX openings, as a matter of general policy, then it should be left with the NCS to decide whether conditions at net time warrant cancellation. If so, he should make a transmission to that effect to inform net members.

Such a net, if it is to operate regardless of propagation conditions, should have a net frequency that is above the DX portion of the band in question. There are too many nets operating at 50.4 or lower, for example. They have little chance of functioning successfully if the band is open, unless they move higher in the band. The situation is less critical on 144 Mc., but the basic idea still applies.

Something new in hidden stations was pulled off the unsuspecting members of the Milwaukee 6-Meter Net in a recent hunt. The hidden station was a Communicator, connected to the antenna at one of the Milwaukee Police radio stations, 300 feet up in the air. Operators were W9ESB and her husband, whose call does not appear in the report we have. First hunter to brave the Police Station entrance was K9KCU, closely followed by W9ROS and K9IUA.

The v.h.f. picnic season is coming up. Here are two such

events scheduled for July: The Annual Turkey Run V.H.F. Picnic, an old-timer in the field, will be held July 27. Place, as always, is the Turkey Run State Park, near Terre Haute, Ind. This is a family affair, with fun for all. More information from W9ZHL. Bowling Green, Mo., will be the scene of a similar party July 13. Ed Porter, W9ZFE, says you're all invited.

The recently-organized Greater Cleveland 6-Meter Club is now providing code-practice sessions nightly, 1900 to 1930, on the net frequency, 50.85. Transmissions are made with tone modulation, for easy copy on all types of receivers.

OES Notes

WIAHE, Stow, Mass. — Will be operating on 144 and possibly 220 Mc. from Lincolnville, Maine, week ends through summer and early fall. Forty-element beam for 144 Mc. about ready to go at that location.

W1SUZ, Colebrook, Conn. — Detailed observation of band conditions on 50 Mc. shows marked 27-day cycle effects in F_2 , T_E , E , and auroral propagation.

W3GKP, Spencerville, Md. — W4LTU having moved to Falls Church, Va., meteor skeds are now kept with W4RMU, Oceanview, Fla., nightly at 2200. His frequency: 144.09 Mc.

Keeping record of voltage fluctuations on telephone line, as possible indication of aurora. Would be glad to hear from others with experience in this field.

W3JWZ, Glenšaw, Pa. — Good quality TV being transmitted by W3QVVX, Fox Chapel, to W3MQT, Monroeville, an 11-mile path. Gear uses modified AXT-2 transmitters and ASB-7 receiver.

W4HHK, Collierville, Tenn. — Continuing daily observation of compass readings. Maximum change thus far observed was $\frac{1}{4}$ degree east, noted on March 24, 26, 28 and 29. Correlation with auroral effects observed on v.h.f. bands still not conclusive.

W7BDK, Seattle, Wash. — Working on 1296-Mc. converter. Uses crystal mixer, 1N21, with injection string consisting of 12AT7 and 6AK5 oscillator-multipliers to 311.5 Mc. driving CK715 crystal multiplier to 1245 Mc. I.f. output at 50 Mc. feeds low-noise converter at that frequency. Also experimenting with homemade parabolas, for best combination of light weight, sturdy construction and gain.

W7EPZ, Billings, Mont. — Have heard East Coast station calling "CQ Montana" but could not raise them on 50.46 Mc. Some stations called were operating at or higher than this frequency!

W8WRN, Columbus, Ohio — W8TYY working W8JLQ, Toledo, and W8HRC, Detroit, on 432 Mc. W8CSW works W9HLY, Decatur, Ind., almost nightly on 220 Mc., though W9HLY runs only 10 watts input. Several of local gang working on 220-Mc. gear.

K9GAJ, Fond du Lac, Wis. — Fox River Valley 6-Meter Net invites participation by all stations within range. Operation is on Monday and Wednesday at 2100 CST. Frequency: 50.1 Mc.

W9JY, Indianapolis, Ind. — Working cross-band duplex with W9MHP, 220-51 Mc. Operation on different bands makes for excellent duplex results. Also working K9GWP, Bloomington, nightly on 220 at 1900. Other locals becoming convinced that 220 does work, after demonstration on these circuits.

W9LVC, Beloit, Wis. — Silver-plating tank circuit in 1-kw. amplifier using 4-125As on 144 Mc. raised output by 100 watts, as indicated on Micromatch. With 37-foot Yagi at 80 feet now make nightly contacts with W8SDJ, 10 miles north on Cincinnati, more than 300 miles. On 432 Mc., have heard W9FRN, near Chicago with good signals. Antenna on 432 is a 4-16-element Yagia. A 416B preamp is built into the antenna.

K0ABK, St. Louis, Mo. — Would like to work on 420 if there are others locally who will go along.

W9MOX, Overland Park, Kan. — Had opportunity to borrow General Radio Admittance Meter for use in adjusting 2-meter array. Being a direct-reading device showing resistive and reactive components, with the sign of the reactive term, it really cuts adjustment time.

LATE REPORT — First ZL-W4 50-Mc. QSO. Just after this copy was made up word was received of additional 50-Mc. DX to New Zealand. W4CQP, Hollywood, Fla., worked ZL2DS April 22, at 1710 EST. This is the first reported work with ZL outside W6.

YL News and Views

CONDUCTED BY ELEANOR WILSON,* WIQON

RESULTS: NINTH ANNUAL YL-OM CONTEST

Some 300 YLs and 1500 OMs participated in the YL-OM Contest sponsored by the Young Ladies Radio League the first and third week ends in March. Approximately 400 more OMs participated in this year's contest than last year, while the number of YL contestants remained about the same as in 1957. One hundred-forty-nine phone logs and 120 c.w. logs were received from OMs (91 phone and 99 c.w. last year). Eighty-one phone logs and 51 c.w. logs were submitted by YLs (73 phone and 54 c.w. last year). These figures represent logs received for scoring; numerous logs were submitted for checking purposes only.

YLRL Vice President and chief log-checker Kay Anderson, W4BLR, concluded: "Scores

* YL Editor, *QST*. Please send all news notes to WIQON's home address: 318 Fisher St., Walpole, Mass.



Second place phone winner in the contest was one of our Alaskan YLs—KL7BHE, Sheila Goodhue of Anchorage. Licensed in 1954, Sheila does a lot of operating with WAC, WBE, YLCC, and has an application for DXCC to her credit. Her rig is a B & W 5100 and a 75A-4 with three element beams on 10 and 20 and a five element on 15 meters. Favored frequencies are 21,380 and 28,625 kc. Sheila and her OM, KL7PIV, drove 60 miles with their two young daughters to Portage Glacier to take this photo with "authentic Alaskan background." Sheila's handsome parka was made of Arctic squirrel, which she tells us the Eskimos call "sic-sic-puk." Sheila operated in Dayton, Ohio, in 1955 as W8EBM, but she now hopes to be a permanent KL7.



First place YL phone winner W5DRI, Dena Morgan, of Brookhaven, Mississippi, was second place phone scorer in last year's YL-OM contest. She operated on several bands, using a B & W 5100 and a Collins 75A-3 receiver for a winning rig. Dena concluded that while she enjoyed the contest very much, she was glad when it was over because her OM, W5DQK, and her three children "fared too well without (her)." Last year Dena worked 133 countries on phone, and she has applied for DXCC.

were higher than ever before. Fifteen meters was again the most popular band with ten a close second. Activity was reported on all bands from 160 to 2 meters. Eighty c.w. has been losing its popularity among the contestants. Most preferred to stay on twenty or forty during the night hoping to catch new multipliers rather than pile up numbers."

Some of the comments W4BLR received accompanying the logs afford chuckles and food for thought:

From the OMs—"My first contest, was surprised to find such good YL operators on c.w."—"The only time in the year that the ladies will talk to me"—"Couldn't we

Edith Viburg, W9WZL, of Milwaukee, was third place YL c.w. winner. Licensed in 1953 Edie is employed as a technician at Centralab. Excepting her NC-300 receiver, she has built all of her radio gear herself. She constructed her electronic keyer according to a Dec. '54 *QST* article, and she uses a separate antenna on the receiver and keys the oscillator allowing full break-in operation. She uses a longwire for 40 and 80 meters and a vertical ground plane for 20 meters. Edie's husband and daughter are "tolerant of ham radio, but they don't share her enthusiasm."





Y.L. C.W.

Call	No. of Sections Worked	Score	Call	No. of Sections Worked	Score		
W1RLQ	308	62	23,870*	W7PTX	185	38	8,788*
			W7PUV	152	32	6,080*	
K2ZQG	259	40	12,950*	W7LXQ	87	27	2,340*
K2ZQH	136	41	7,483*	W7FDE	21	16	420*
K2ZKQ	110	28	3,090*	KTADL	4	2	10*
K2DKL	32	14	560*	W8QQQ	288	49	17,640*
K2AGJ	16	7	140*	W8UAP	200	35	8,750*
W3TSC	293	44	16,115*	W8SNB	143	32	5,720*
W1YPT	100	23	3,580*	W8OGY	112	29	4,060*
K3BLG	120	13	2,904*	W8KZL	114	29	4,133*
W3CDQ	26	15	585*	W9WZL	383	47	22,501*
W3GEU	42	10	525*	W9KSE	188	31	7,285*
W5EGD	378	64	24,192	W8MYC	82	25	2,563*
K5LJU	325	49	20,106*	W9MLE	36	20	720
W5IKC	98	27	3,308*	K9IKL	197	39	9,601*
K6WQ	260	49	12,740	K9GIC	148	36	6,660*
K6QPG	182	49	9,100*	G2YL	38	20	950*
K6ENK	179	50	8,950	K4BFTX	157	40	5,010*
W6PFT	84	28	2,930*	K1L7ALZ	155	43	8,331*
W6QMO	120	20	2,500*	VE2AOB	64	20	1,600*
W6NAZ	70	20	1,400	K6SYR	24	19	75*
K1ADY	85	31	3,294*	VE3DDA	11	8	110*
W1ZEN	37	15	6,000*	K6HOI	12	5	2,500*
W1QKJ	29	13	4,71*	K6NPG	14	2	35*
W1MDB	42	8	420*	VE7ADR	46	24	1,380
W1RLQ	397	57	28,286*	Y.L. PHONE			
K1DZG	366	61	22,326	W6EHA/M	154	32	6,160*
W1YPT/L	202	40	8,080	K6HOI	170	16	3,400*
W1IIC	226	30	6,780	K6PWH	133	19	3,159*
K1ADY	85	31	3,294*	K6ENK	170	13	2,210
W1ZEN	37	15	6,000*	W6LFF	25	19	594*
W1QKJ	29	13	4,71*	W6WDL	22	2	55*
W1MDB	42	8	420*	W7DXM	529	56	37,030*
K2JYQ	204	48	12,240*	W7DRU	330	45	18,562*
W2EWO	172	46	11,912	W7KAE	200	44	8,500*
K2ZQG	200	28	7,000*	W7DXQ	65	28	2,273*
W2OWL	33	13	536*	K7AAL	57	21	1,496*
W3BIW	201	37	7,437	W7CSQ	45	23	1,294*
W3APT	98	31	3,836*	W8NDS	384	56	21,504
W3GTC	56	22	1,232	W5KZL	66	24	1,584*
K3BLG	32	11	440*	W8TPZ	51	18	1,147*
W4KYI	370	70	32,375*	W8WUT	18	11	248*
K4KRR	172	48	13,330*	W9MPX	264	63	20,790*
W4BIL	262	43	14,083*	W9KSE	200	40	10,000*
K4FEP	271	38	12,860*	K9CQF	159	39	7,751*
W4VOM	129	26	6,000*	K9BRJ	118	37	4,366*
K4CZP	182	32	5,824	W6VNC	72	17	1,530*
W4WPD	136	25	4,250*	W9VPH	199	20	1,000*
W4BLR	100	35	3,500	W9LDK	43	16	860*
W5DRI	703	73	64,149*	W9STR	52	15	780
K6GKQ	632	67	52,930*	W9BFS	429	60	32,175*
W5EDQ	465	46	28,181*	K9EPE	432	22	22,464
K6JU	156	46	16,988*	W9VPH	377	48	30,000*
K5HTQ	233	43	13,889*	K9GIC	177	35	12,119*
W5YKE	190	34	8,075*	K9GRG	197	43	10,588*
K3CCJ	100	21	2,100	K0LYV	200	41	10,250*
K5MSE	43	17	731*	W8SZH	222	43	9,546*
K5MIF	20	4	100*	W9ZWL	172	36	7,740*
W5QGX	656	65	42,640	K0ATT	105	25	2,625
K6HGV	659	56	36,904	K9BTW	43	20	1,075*
K6EXQ	801	60	36,060	W9STR	52	15	780
W6JZA	301	47	17,683*	G2YL	52	30	1,950*
W6YZW	280	41	41,350*	K6BGE	273	52	14,296
K6QDQ	237	38	11,257*	K7BHE	681	68	57,885*
K6RQE/M	201	35	8,793*	K7LBJD	256	49	12,544*
W1NLM	41	27	1,107*	KZ5VH	435	56	24,360*
W1AJA	38	22	1,045*	VE3DDA	19	7	166*
W1EQV	30	16	800*	O.M. C.W.			
W1LWQ	13	9	146*	W3OIP	26	18	585*
WINLQ	13	9	146*	W3HWU	22	18	495*
W1QKJ	13	9	146*	W3EIV	25	15	469*
W1MDB	32	2	5*	W3MSR	25	18	450
K2DSW	52	27	1,753*	W3FOX	27	16	432
K2HXR	37	22	1,018*	W3QLW	20	14	350*
K2GTC	34	17	723*	W3KQD	17	10	214*
W2ATC	21	11	285*	W3UIU	15	10	188*
W2CWW	17	14	238	W3GYP	11	6	83*
W2NGE	18	10	225*	W3DXA	10	6	75*
K2PHE	14	10	175*	W3CN	5	5	31*
W2JQA	15	10	175*	W3WHK	5	5	31*
K2VPB	12	9	135*	W4JUJ	47	27	1,586*
K2ZKQ	12	8	120*	K4DRO/4	33	23	949*
W2EWZ	12	8	120*	W4ZQK	25	16	500*
W2JB	9	8	72	W4EFY	27	17	459
W2CUE	8	6	60*	K4EX	20	15	375*
K2ZEG	8	6	60*	W4EPA	14	12	210*
K2UUT	8	6	60*	K4RWX	13	12	195*
K2PDI	7	6	53*	K4EJG	10	6	73*
K2UTV	4	4	20*	W5QVZ	39	20	975*
K2TBU	3	3	11*	W5JID	34	24	816
K2UJZ	2	2	5*	W5AFT	31	21	651
W2ZSN	53	25	1,656*	W5WTC	27	19	631*
W3MDO	42	23	1,208*	K5DKL	25	17	531*
W3ARK	48	23	1,104	W5VZU	26	16	520*
W3YLL	33	20	825*	K5EJC	20	15	300
W3BQA	31	21	814*	W5LGG	17	12	255*

* Denotes low power multiplier used

(Scores continued on page 164)

SPECIAL CITATIONS

Bouquets to W5KRJ, W5SYL, and W2RUF who were recipients of Public Service Commendations issued in conjunction with the 1957 Edison Radio Amateur Award.

Pearl Webb, W5KRJ, of Maplewood, La., was nominated for the award by MARS for her outstanding service during Hurricane Audrey which devastated parts of Louisiana last June. (OM K5BQT, James Harrington of Lake Charles, received the grand Edison award for his efforts in connection with the same storm.)

During 1957 Iva Haley of Grand Prairie, Texas, handled some 2800 QTCs and logged over 2500 hours of operating time. Following the Dallas tornado Iva and her OM, W5MTQ, relayed 1200 emergency messages during a sixty hour period, and following the tornadoes at Silverton and Tyler Iva served as control station for more emergency net operation.

Clara Reger, W2RUF, of Buffalo, N. Y. received a citation for her tireless efforts in the rehabilitation of a fourteen year-old boy who lost both arms when his antenna fell across a high tension line. Clara lifted the youth from his extreme despondency by helping him prepare for a novice license, by sparking an extensive campaign which showered Lynn with QSLs, and by raising funds for a rig which he could work with his feet (see photo).

We can all be proud of these three YLs who contributed so heavily of their time and themselves to worthy causes without thought of remuneration of any kind. Unwittingly they personify the true ham spirit.

• • •

The following was originally published in the August 1917 issue of *QST*. Recently the extract appeared in the March 1958 issue of *Hawk's Eye View*, a monthly publication of the Hoosier Amateur Women's Klub of Indiana. We think that time has made the piece entertaining enough to re-publish again.

YLs of the Washington Area Young Ladies Amateur Radio Club are checking every aspect of the coming ARRL National Convention to be held in August in scenic Washington, D. C. Ethel Smith, K4LMB, and Joan Thompson, KN3ABT, test conditions on two and ten meters in front of the nation's Capitol on famed Capitol Hill, and in the photo on the right Ethel and Joan and Beulah Barrick, W4DEE, and Camille Hedges, W3TSC, make further checks on operating portable on the steps of the beautiful Supreme Court Building. K4LMB is in charge of the XYL program for the convention, and KN3ABT is organizing a Fashion Show guaranteed to delight all feminine guests. W4DEE and W3TSC are assisting John DeBardelleben, W3CN, in his efforts as Chairman of all convention activities for YLs and XYLs. The big weekend is August 15th, 16th, and 17th. Convention headquarters will be the Sheraton Park Hotel. Make your reservations right away for what the committee hopes will be the biggest and best of all ARRL conventions!



W2RUF observes K2DGU's proficiency with his automatic "foot key." (see "Special Citations")

The Ladies Are Coming

When amateur wireless opens up again in these United States of America, things are going to be different. There will be several hundred of the fair sex scattered around among us. This means that we shall have to introduce several changes. We shall have to be careful where we use OM. What will take its place is not apparent. It will not be OW, from what we have heard from various young ladies. They do not take kindly to being referred to semi-affectionately as Old Woman. Some of them will let Old Lady pass,





Have you ever noticed the pride a ham radiates when he or she mentions that his or her wife or husband is a ham, too? The happy connubial smiles seen in the four photos on this page belong to: Upper left: Delores and Bob Vasilow met in 1952 via ham radio as W2EWO of Catskill and W2VDX of Hudson, N. Y. They now reside in Oswego where they are both active in N. Y. state traffic and CD nets (photo courtesy Binghamton Press). Upper right: A well-known XYL-OM team in Sweden are SM5AE and SM5XP. Ann and Tore Gustavsson operate 14, 21, and 28 Mc. phone from Västeraas (photo via W9BRD). Left: From South Charleston, West Virginia, Gloria and Jim Read operate as K8HAI and K8HEX on 40 c.w. Gloria also DXes on 15 and 20 meters (photo via W8PQQ). Below: Jiro and Kazuko Ando, JA6GH and JA6KH, of Fukuoka, Japan. Mr. and Mrs. Ando enjoy frequent contacts with W6 hams on 7 Mc. (photo via K6DV).

although there are others who object to even this. We would not venture to make a suggestion in such a delicate matter, but just the same, we fully expect to hear DG. This will sound pretty chummy, but in wireless where you cannot see the other person, and where you never expect that you will see them, and where formalities are more of a dead letter than in anything else we know of, it might be that calling an unknown lady, dear girl, might be taken all right.

Language will have to be improved a little bit because, "keep out, you big Ham," will not be exactly polite when the ladies are around. We never have had much profanity on the air, so this will go as it is, but we fully expect to see a general uplift throughout the fraternity when the ladies join us. Here's to them, and it gives us great pleasure to extend the glad hand of fellowship when the happy day comes, and we will reopen.

PLANS MADE?

For Field Day, of course! The big week end of the year is coming up fast. June 28 and 29 are the dates. Don't forget to send us a report of your activities — pictures, too.

1958 AWTR

The Twelfth Annual All-Woman Transcontinental Air Race is scheduled for July 4-8 this year. Take-off will be from Montgomery Field, San Diego; contestants will cross the finish line at Charleston, South Carolina Municipal Airport. Chairman of the amateur net, set-up to aid the flyers at the start and terminus points and at each of the stop-over cities en route (Yuma, Tucson, El Paso, Midland, Abilene, Tyler, Jackson, Montgomery, and Macon) is Carolyn Currens, W3GTC, of Norristown, Pa.



I.A.R.U. News

QSL BUREAUS OF THE WORLD

For delivery of your QSLs to foreign amateurs, simply mail cards direct to the bureau of the proper country, as listed below. Cards for territories and possessions not listed separately can be mailed to the bureau in the parent country; e.g., cards for French Cameroons (FES) go to REF in France; cards for VP8s go to RSGB in England. W, K, VE and VO stations only may send foreign cards for which no bureau is listed to ARRL.

For service on incoming foreign cards, see list of domestic bureaus in most *QSTs* under "ARRL QSL Bureau."

Algeria: G. Deville, FA9RW, Box 21, Maison-Carree, Alger
Angola: L.A.R.A., P.O. Box 484, Luanda
Argentina: R.C.A., Carlos Calvo 1424, Buenos Aires
Australia: W.I.A., Box 2611 W, G.P.O., Melbourne
Austria: Oe. V.S.V. P.O. Box 15, Klosterneuberg, 2
Azores: Vin Portugal
Bahamas: C. N. Albury, Telecommunications Dept., Nassau
Barbados: Arthur St.C. Farmer, Storms Gift, Brandons, Deacons Road, St. Michael
Belgian Congo: OASFH P.O., Box 614, Jadotville
Belgium: U.B.A., Postbox 634, Brussels
Bermuda: R.S.B., P.O. Box 275, Hamilton
Bolivia: R.C.B., Casilla 2111, La Paz
Brazil: L.A.B.R.E., Caixa Postal 2353, Rio de Janeiro
British Guiana: D. E. Yong, VP3YG, Box 325, Georgetown
British Honduras: L. H. Alpueh, VP1HA, P.O. Box 1, El Cayo
Bulgaria: Box 830, Sofia
Burma: Fit. Lt. Aung Myint, XZ2OM, BAF/1064, % Dept. of V.C.S., D.S. (Air), Ministry of Defense, Rangoon, Union of Burma, Asia
Canton Island: H. B. Johnson, KB6BA, U.S.P.O. 06-50000, Canton Island, South Pacific
Ceylon: P.O. Box 907, Colombo
Chile: Radio Club de Chile, Box 761, Santiago
China: M. T. Young, P.O. Box 16, Taichung, Formosa
Colombia: L.C.R.A., P.O. Box 584, Bogotá
Cook Islands: Ray Holloway, P.O. Box 65, Rarotonga
Costa Rica: Radio Club of Costa Rica 2412, San Jose
Cuba: Radio Club de Cuba, QSL Bureau, Ayestaran 629, Altos Cerro, Habana
Cyprus: Mrs. E. Barrett, P.O. Box 219, Limassol
Czechoslovakia: C.A.V., P.O. Box 69, Prague I
Denmark: OZ2NU, Borge Petersen, P.O. Box 335, Aalborg
Dominica: VP2DA, Box 64 Roseau, Dominica, Windward Islands
Dominican Republic: Calle Duarte #76, C. Trujillo
East Africa: (VQ1, VQ3, VQ4, VQ5): P.O. Box 1313, Nairobi, Kenya Colony
Ecuador: Guayaquil Radio Club, Casilla 784, Guayaquil
Eire: I.R.T.S. QSL Bureau, 39 Booterstown Ave., Blackrock, Dublin, Ireland
Ethiopia: Telecommunications Amateur Radio Club, P.O. Box 1047, Addis Ababa
Fiji: S. H. Mayne, V8, R2A Victoria Pasaed, Suva
Finland: SRAL, Box 306, Helsinki
Formosa: HQ MAAG, APO 63, San Francisco, California
France: R.E.F., BP 26, Versailles (8 & O); France (F7 calls only): A/IC Thomas J. Shytle, F7EZ, HQ, US Eucom Mars Radio, APO 128, % P.M., New York, New York
Germany (DL2 calls only): Via Great Britain
Germany (DL4 calls only): DL4 QSL Bureau, % Mars Radio, APO 12, N. Y., N. Y.
Germany: (DL5 calls only): Via France
Germany (other than above): D.A.R.C., Box 99, Munich 27
Gibraltar: E. D. Wills, ZB21, 9 Naval Hospital Road
Ghana: E. L. Lloyd, ZD4BL, Box 565, Kumasi Ahananti

Great Britain (and British Empire): A. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent
Greece: George Zarifis, P.O. Box 564, Athens
Greece (Unlisted SVs only): USASG, APO 206, New York, N. Y.
Greenland: APO 588, % Postmaster, New York, N. Y.
Grenada: VP2GE, St. Georges
Guam: G.R.A.L., Box 145, Agana, Guam, Marianas Islands
Guantanamo Bay: Guantanamo Amateur Radio Club, Box 55, NAS, Navy 115, F.P.O., New York, N. Y.
Guatemala: C.R.A.G., P.O. Box 115, Guatemala City
Haiti: Radio Club d'Haiti, Box 943, Port-au-Prince
Honduras: O. A. Trochez, P.O. Box 244, Tegucigalpa, D. C.
Hong Kong: Hong Kong Amateur Radio Transmitting Society, P.O. Box 541, Hong Kong
Hungary: H.S.R.L., Postbox 185, Budapest 4
Iceland: Islenskr Radio Amatorar, Box 1058, Reykjavik
India: P.O. Box 534, New Delhi
Indonesia: P.A.R.I., P.O. Box 222, Surabaya, Java
Israel: I.A.R.C., P.O. Box 4099, Tel-Aviv
Italy: A.R.I., Viale Vittorio Veneto 12, Milano, Italy
Jamaica: Ruel Samuels, VP5RS, 34 Port Royal Street, Kingston
Japan (JA): J.A.R.L., Box 377, Tokyo
Japan (KA): F.E.A.R.L., P.O. Box 111, APO 500, % Postmaster, San Francisco, Calif.
Kenya: East Africa QSL Bureau, Box 1313, Nairobi
Korea: Mr. In Kwan Lee, Chief Engineer, Radio Supervisory Bureau, O.P.I.R.O.K. Seoul (HL2AM via ARRL)
Kuwait: William N. Burgess, MP4KAC, % Kuwait Oil Co., Kuwait, Persian Gulf
Lebanon: R.A.L. B.P. 3245, Beyrouth
Libya: 5A2TZ, Box 372, Tripoli
Liechtenstein: via Switzerland
Luxembourg: G. Berger, 40 Rue Trevires, Luxembourg
Macao: Vin Hong Kong
Madagascar: P.O. Box 587, Tannarive
Madeira Island: P.O. Box 257, Funchal
Malaya: QSL Manager, Box 777, Kuala Lumpur
Malta: R. F. Galea, ZB1E, "Casa Galea", Railway Road, Birkirkara
Mauritius: V. de Robillard, Box 155, Port Louis
Mexico: L.M.R.E., Apartado Postal 907, Mexico, D.F.
Montserrat: VP2MY, Plymouth
Morocco: A.A.E.M., P.O. Box 2060, Casablanca
Morocco: (Tanger International Zone only): Box 150, Tanger
Mozambique: Lige dos Radio-Emissores, P.O. Box 812, Lourenco Marques
Netherlands: V.E.R.O.N., Postbox 400, Rotterdam
Netherlands Antilles (Aruba): Postbox 392, San Nicolas, Aruba
Netherlands Antilles (Curacao): Postbox 383, Willemstad, Curacao
New Guinea: Via Papua
New Zealand: N.Z.A.R.T., P.O. Box 489, Wellington C1
Nicaragua: YN1RA, Apartado Postal 555, Managua
Northern Rhodesia: N.R.A.R.S., P.O. Box 332, Kitwe
Norway: N.R.R.L., P.O. Box 898, Oslo
Okinawa: O.A.R.C., P.O. Box 739, APO 331, % Postmaster
 San Francisco, Calif.
Pakistan: Box 4074, Karachi
Panama, Republic of: L.P.R.A., P.O. Box 1622, Panama
Paraguay: R.C.P., P.O. Box 512, Asuncion
Papua: VK9 QSL Officer, P.O. Box 204, Port Moresby
Peru: R.C.P., Box 538, Lima
Philippine Islands: Elpidio G. DeCastro, Philippine Assn. for Radio Advancement, 2046 Taft Ave., Pasay City
Poland: PZK QSL Bureau, P. O. Box 320, Warsaw 10
Portugal: Rua de D. Pedro V., 7-4, Lisbon
Romania: A.R.E.R., P.O. Box 95, Bucharest
(Continued on page 164)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W9BRD

How:

Most amateurs recognize that the purpose of radio call signs includes (1) installation and/or operator identification, (2) national designation, and (3) geographical indication. In h.f. DX work all three of these angles can be crucially important. We know this. But several overseas licensing authorities apparently do not, for in certain areas of the globe call signs are issued and reissued in patterns of supreme ambiguity.

Regarding (3) we refer such unmindful powers-that-be to the Mauritius plan (last month's "Where" text) for an exemplary stride in the right direction. And reference (1) we reiterate our periodic appeal: Retire suffixes for at least one year, preferably longer, before reassigning them. We see no reason, for example, why newcomer Joe Doaks must inherit and fight off Slippery Smith's atrocious QSL reputation and operating notoriety; or why valuable QSLs for Doaks must wind up at the forwarding address of Smith.

Further specific pleas should be obviated by one simple question which we put to licensing authorities throughout the world: Beyond mere official bookkeeping, do the amateur call signs you issue clearly fulfill their purpose?

Last month's "YL News and Views" presented interesting data concerning Les Girls *vis-à-vis* DX. We note that the 64 DXCC memberships won by 58 YLs includes nary a qualifier from Asia; also that W7QGF and W0CXC are solos in their call areas, with VE3DKY the lone Canadian Clubber.

The salient statistic, however, seems to be the actual quantity of ladies listed. Even the most conservative reference to total-YL-hams estimates appears to put this feminine DXCC representation far below par. *Viz.*, the ratio of OMs to YLs in amateur radio certainly is not as great as 4500 (roughly the number of masculine DXCC diplomas extant) to 64!

Which inevitably leads us to the disconcerting conclusion that our slick chicks are generally cool to the DX facet. 'Smarter, gals? What's with this nix-DX? Perhaps it's unmaidenly to burn the midnight oil or rise with the chickens to work Asia on 20. Or is it unladylike to clobber competition in the pile-ups? (No, it can't be *that*; we've seen you kids in action at fire sales.)

Field Day comes but once each year,
A dandy chance to soak your gear!
— *Al Fresco*

Corny couplets to the contrary, may the sun shine bright on your own FD site this month

* 4822 West Berteau Avenue, Chicago, 41, Ill.

during hamdom's one annual all-encompassing operating activity which calls together DX men, traffic hounds, v.h.f. specialists, rag-chew artists, and what have you. *Carpe diem* — to the field!

It occurs to us that the "How's" readership might be interested in random DX-worked data filed by portables in this year's event. If convenient, rifle through your outfit's archives and let Jeeves & Co. know how you make out in the line of continents and countries worked. Of course we know it's a sheer impossibility for FD congregations to QSO anything like, say, 100 different countries within the brief allotted operating time. Well — it is, isn't it?

What:

Anchors aweigh! Field Day time is DXpedition season, too, and our bands are rife with rumors of roving. Scuttlebut samples would have ILADW imminently off to San Marino; F8FC, ON4AU and others to Andorra as PXIFC; F7DL and cronies to the same place; PY1CK to Trindade Isle; W6LTH to VP0RT, FS7RT, PJ2MC and undisclosed destinations; TI2s HP RC and VE3MR to San Andres; VE3MR thence to St. Pierre; VO3SS to Zanzibar; VQ4is AQ and KRL to Seychelles; VP2VB/MM to Aver Island etc.; VS1HDX & Co. to the Maldives; VU2RM, *et al.*, to Nepal; ZS6IF to ZS7/8/9; HA5AM to his HA5AM/ZA hangout; KP4IAO to Navassa; SM3BYG to Trucial Oman; the usual W/K/VE vagabondics to the Caribbean circuit; and John Foster Dulles, VIP, to Lord Howe Island or the Aldabraas. When? What bands and emissions? Where to QSL? Keep an ear on W1AW and consult your favorite crystal ball regularly. Meanwhile,

20 c.w., summer resort of long DX tradition, is the anchor of mail from W1s BIL TYQ, W2s ATC HBV HMJ, W3s LAX LOS (51/25 worked/confirmed), W4s CYY KFC UWA/2, W5s CAN MY, W6s KG RLP (195/171), ZZ, W7s CSW DJU GYR VCB YAQ, W8s IBX (109/85), KPL, W9s ERU (213/165), JUV/9 UBI YYY; KIACC, K2s BJA RQC (52/31), UFP, K4s HIG HPR IEX JOS MOF MWB (56), PHY RJM, K5s AUZ ESW, K6s CQF CTV QHC SHJ SXA (113/57), TXA (130/90), VTC,





TF2WCC (W1ZMO) offers his Keflavik diggings as our QTH of the Month, views typical of the scenery surrounding most of the TF2 gang. Bob transmits on several DX bands but derives much of his hammering fun from monitoring activities on 160 meters where he consistently logs and tapes signals from three continents. (Photos via W1BB)

K9ELT; DL4BL, HR1JH, KR6BW and VE1PQ (211/196). They suggest you keep an ear open for AC5PN, BVIUS, CN2s AQ BK (14,006 kc.) at 2 GMT, CR4 4AH 4AR 6AJ 3, 6BX (15) 10, 8AC 9AH, CTs, 2AI (60) 10, 2BO (25) 10, 3AB, DM2ALN, DU5 7SV 9JO, EA6s AW AZ (90) 7, F9QV/FC, FB8s BS CE, FF8s BZ CF 3, FK8AS (21), FL8AC (37) 5, F08s AC 5, AG, F08AJ, FV8s, FY7s YE YE, GD8UB (20) 17, HA8 2MF 2TY (5A2TY?) 4YB 5BW 5D 5KB 8WS, HB4FE of Switzerland's military, HC1HL, HE9LAC, HH2s KVU Y, HKs 3MM 0AI of San Andres, HE19T, KT KY, HP9FC/mm, HR2FG, HSIC 18, 15FP 3, IT1TAI, JT1AA, JZ0HA (40) 13, K6TSQ/KG6 (39), KA8 2KS (100), 9AF, KC4 USF USF, KC6JC (10) 9, KG1IB (6), KG6 AAY FAE, KM6BJ (10) 6, KP6AK, KR6s BL EB QW 13, KV4s AA (80) 10, BO, KX6s AF BP 11, BQ, LU3ZQ (70) 4, LX1MG, LZ1KBA (90) 5, OH2YV/0H0, OQ5IG (40) 1, OX3UD (70) 4, OY2H, Pj2s 2AQ 2ME (70) 3, 3AB 5CB, PZ1AP (15) 1, SM1B5A (25) of Swedish award (WGSAs) desirability, ST2s AC AR (80) 23, SV9WP 7, TF2WCT, TG9MR (30) 4, TI2s LA PZ WD WR (10) 12, UA1KA of Russia's Pt. Mirny, Antarctica, base, UA9s DR KCK (1) 3, KOH (80) 15, OI UN, UA9s CD (40) 6, DM 7F IJ KCO KDA KJA KKB KKD OM, UB5s galore, UC2s AF CB (10) 9, UD6KAB, UH8KAA, U1SAB/UJ8, UJ8KAA, UN1KAB (40) 17, UO5AA 7, UP2KCB (30) 7, UQ2s AB 6, AK 9, BA KAA (60) 6, KAB, UR2AK, U3BQL 9X, VK9s AD (26) 6 of Norfolk Isle, 9BB 9JF 9XK 9XM, VK9s AB RO (10), VP8s 6P 7P 7G 7N 7M 8V, VQs 2EW 3CF (30) 13, 6AB 6LQ 4, 8ASR, VR3s A C R, VSI1s DU FZ GK GL GX (20) 15, HQ VR18, VZs 2DW (40) 22, 4BA (86) 13, 6DV (15) 12, 6EC (18) 16, VU2s AJ CK 2, GE SX, W3PZW/KG6, W4WSP/KG6, XW8IA, XZ2TH, YJ1DL 11, YO8s 2CD 2KAB (90) 1, 3XU (81) 5, VVs 1AD 4AU 5B (40) 5, 5HL, ZA1s ADG (50) 5, KAS (19) 2-3, KM, ZB8, 1DC 2Z, ZC8 3AC (90) 4P (32), 5AL (60) 9, ZD2 3CKH 3G (84) 0-2, ZE8 6JX (52) 1, ZKs, 1AA 1AK (10) 10, 2AD 18, ZM6s AS (10) 9, TT, ZP5s AW 4, AY, ZS8s 3B (100) 18, 3DP, 8KX, VP6W, 4X4KK, 5As 1FA 1, 2TY 5, 4TC (10) 3, 9G1 CM 21, CN (80) 20 and 9K2AN (52) 22-23.

20 phone keeps W1PNR, W4RQR*, W6s OHB RLP ZZ, W8YIN*, K1CBK, K6s SHJ TXA; DL4BL, HK7LX, HR1JH* and VE1PQ busy with BVIUS (160) 12-15, CE7AY, CN2DD*, CO5LF*, CT3AN (140), DU1MG (190) 15, ET2US*, FF8AP (160), HL9KT (150) 7, KA2s J4A (15), 2Z2 (160), JU (190) 15 of Iwo Jima, KC4USB*, KC6CG (230) 14-15, KG1FR* (258) 3, KV4AA* (280) 2, KW6CO (250) 6-7, ODSBZ* (303) 2, OH6NC* (322), 6, OY2Z, UA1DZ (140), VE1BQL/SU, Vks 9MK 9YT (143) 13 of T.N.G. 9TC of Macquarie, VP8s 4TE* 5AB* 5RS* 6LTS*, VR3s P (170) 8-9, R (110) 11, VSs 2DQ (190) 14-15, 2DW (130) 15, 6AE 13, 6DJ (110) 15, 9AJ, XZ2TH, ZS6KO/ZS7* and 9G1BQ, asterisks tagging s.s.b. users.

15 c.w. makes a strong showing so late in the season, supplying W2J0A, W3s CMN LAX, W4s IV KFC UWA/2, W6s CG KG ZZ, W7s DJU GYR IXH (55/17), UYA, W8s IBX JSU, W9s UBI ZTK; K1s ACC CBR, K2s PIM PPT PPV (43), SFA UFP UYQ, ZDZ, K4s HIG HPR IEX LAY MOF PHY (53), K5ESW, K6s CTV QHC SXA VAW VTC ZDL, K8s ELT G8G ISP JIN, K6GRs; DL4BL and KR6BW with the likes of one AC4BF, BVIUS, CN2s AQ AY 22, BK (100), CN8U, CR4 4AD (40), 6AI 22, 7LJ 19, 9AH 15, CT3AB (100) 21-22, DM2s ADE ALN, DU7SV, EA8BK (31) 18, EL1K, F9QV/FC, FA9JO, FE8AH 23, FF8s AJ 17, BF 23, FK8AL, FQ8AP 22, GC8DO (60) 18, BHs 1M0/4F, HC1LE, HHs 2KVU 3JC (80) 22, HH8BE 16, HK40A (110) 3, JAs 1BSO (70) 4, IVX, 2YT (20) 5, 3AF 4BB 6PA 7AD

22, JT1s AA 15, YL 15, K4AQL/KG6 (30) 6, K5DFS/KG6, KA2s MP (60) 5, RB (140) 4, KC4USB 5, KG1s CK 1B 21, KG4s AI 23, AS 1, KG6s AAY FAE, KP6s AK AI, KV4AA, LX2GH 14-15, OA1s AGI BP, OD5BZ 20, OQ5s BT 1, GU 1, OX3DL, Pj2s AN AO 22, ME (80) 2 of Sint Maarten, PZ1AO 22, ST2AR 20-21, SV8WP 20, TF2WCG (48) 22, 2WCT 21, 3KG, UAs 1BI (40) 15, 1DA 9CM 9KCB 13, 9OI, UB5s FG KMB, UD6KAB 13, UL7HB 17-18, UO5AA (19), UQ2KAA 15-16, UR2KAA 17-18, VK9XK, VP8s 7NG 22, 8CR 21-22, 9CR, VOs 4FK 6, 6LQ (60) 2, 6P8P, VS6EC 13, VU2RM 16, XEs 1RM 1YF 2FA, YN1AA (40) 12, YOs 3RF 5LC (50) 18, YV5BJ, WH6CIZ 3, WP4s AKG ALQ, W3PZW/KB6 (90), W5RYG /KG6 19, ZB1s DZ (57) 22, SS (40), VV, ZC8 4IP 15-16, 5A (35), ZD3G (36) 23-0, ZE1JV 22-0, ZP9AY 23, ZS3AG (72), 4X4s DK and JU 19.

15 phone fanciers find fewer prolific breakthroughs en masse, the average now, but W1PNR (134/130), W3CMN, W6ZZ, W7, LX1, YAO, W9WBM; K1s ACC CBR, K2s CTI (101), ZDZ, K4s LAY PHY, K6s CQF CTV, K9GSG, K6GRs; HR1JH, KR6BW and British Guiana monitor, C. V. Edwards recommend CE3AGI of IGY ben, CE9AE, CN8QX, CR6Cs 1EL5A 3, F08AZ, GD3UB, HC1LW, HL9KT 3, HP3FI, KA2s AL (240) 6, RR ZZ, KO6CG (340), 9K5s 1EE 4AL, KX6s BP BU LX1DQ, OAAK, OD5AV, Belgian Antarctic entry OR4VN, SV 1AA (170) 5, 9FR, TF2WCT, TGs 7 CB 2, 788 OTS, Ti5 JAP 8WTC, VE3BQL/SU of Gaza Strip, VK9JF (180) 12-13, VP8s 3AD, SAB 5AK 5BL 6L1 8CJ, VQ2AS, XE1H, YN1s ARM FF 2P, YS1MS, YV5GY, ZD3F, ZE2JE, ZK1BS, ZSs 3AG and 8I.

15 Novice news thins seasonally but the game still is 15 foot. KN2s HIY ZDZ, KN4RJN, KN5JZ, KN7APZ and KN91SP out impressive shack display material from CT1J5, DU7SV, E14J, FA8R, HISBE, JA1JU, KGs 1EE 4AS, KZ1CD, KZ2s DNN RHN, LU1s AA1H 1DEN 7FAL, OQ5GU, PY7AFK, SP5AR, TFs 2WCT 5TP, VKs 2H 2ZL 3DQ 3K 4XK, VP6N, WH6CIZ CJJ COV CRN, WP4s AKG AKU, XE2FA, ZB1DC, ZLs 1MT 1TB 2GH 2IQ, ZS8s FF JK and 4X4JU. **Forty** finds Novice range news from KN4PVU (now K4PVU) who added PY7AGC; KN4QLN who worked WH6CQG (7161 kc.); and KN7AYP who, with buddy KN7CEO, three-waved with DL4ET. KN4PVU also scored on 3.7 Mc. with WP4ALD.

10 c.w. estivates peacefully, dreaming of the triumphant season just closed. But before the calm closed in, W3s CMN ZK1H, W4KFC, W5KLB, W6s KG ZZ, W7VCB, W8s IBX KX, W9s FNX PCQ YIG; KIACC, K2s 3AMH/4, K4EJG, K5ESW, K6s CTV SXA and K9ELT cashed in on BVIUS, CE8AG 4AD, CN8s GU JX, CR6s 22, CT3AB, DU7SV, EA8BP, FF8s AD (80) 20, AJ, GD3UB, GC8DO 17, HASW8, HR1B1, ar, HC1HL, HH2s K KVU HISBE, JA1JAC 1BI 1VX 3AB 3AF 3A1K 3WS 7AF 6Z, KCT8Q/KG6, KG6s AAY FAE, KP6AK, KR6s BF SI, KX6AF, LZ1KEP, OA8s AGI FA, OD5BZ, OQ5GU 21, Pj2ME, SP8CK, VK9XK, VP8s 6GT 7NG 9CR, VOs 2RD 22, 2RQ 4FK, VS9AC, VU2MD (48), XEs 1YF 2FA, ZB8s 1CJ 21, ZC5AL, ZD7SA (60) 18, 20, ZP9AY 22 and ZS8AG 21. **Eleven saw W4s KFC UWA/2, W8IBX, K2UFP, and K6SXs capture CE3AG, HH2KU, HK1FF, KC4USB, KG6s AAE, KP6AK, KX6AF, VK2GW, VP7NG, XE1YF and ZL1MQ code-fashion.**

10 phone closes out the late spring rush in fine style, BVIUS (300), CE3AGI, CN2WX, CN8s HU (178), HW1J (50) 14-15, DU6IV, EA6BS (250), EL8D, FS7RT (490) under W61TH auspices, FY7YE, GD3Y1s, HC1s AGI HL MD, HH2Z, HKs 3EV 7LX, HL9KT, HR2MT,

JAs 1EC 1EW 4AH, KA2s EB EN JO RB (400), ZZ, KAs 8RA 9LJ (490) of the Bonins, KCs 4USW (640), 6CG, KG6AGY, KM6BK, KR6s GC LC QW SW, KV4BL, KX6s AF BP CA CC CG, OD5BZ, OY1R, PJ2AL, SV9s WS WU, TF2WCW, TG9RQ, UA9 9MI 9LA (225), UNIAB, VE3BQL/SU, VK9LE, VP8s 1GLC 2GX 4LO SBP 6TR 8CV, VQs 2AS 4FK, VRs 2BC 3A (320), VS 2DQ (475), 6DJ 9AP, VU2CQ, YS1M8, ZC4IP, ZD8s 3E 3F 6JL 78A, ZKs 1BS (440), 2AB (338), jolly ZM1BL (449), ZP9AU, Zs 5NZ/Z5T (450), 7C 8I, groovy 214AA, 4X4GB, 5A4TT, 9G1s AA and CH, (440) were cultivated by W1EKU, W3ZKH (149 on 28 Mc.), WS 8RY KLR MZP, W6s BB (QAC opping), ZZ, W7s PNN VCB YAQ, W8IBX; KIACC, K2s SBT SFA TEZ VAB, K3AMH/4, K5ESW, K6SXs and K7LX.

40 c.w., atmospheric and all; receives the approbation of W2jBL, W4JYP, W4s KFC UWA/2, W6KG, W7s DJU SU1 YAQ, W8IBX; KIACC, K2s UFP VOM, K4RM, K6s CTV QHC SXA, K4CRs and K66W, doubtless because of CN8s BP GU DU7SV, EA8BF, HK3KG, HL2AW (26 AB 1A1s AE1 B1 BKS BVS PS VX, JA2W, JA3s 1B 1A1s AB BB TT ZY, JA4 5AB 6FB 6BE, KA2RB, KC4USB (8), KG6FAE, KRs 8F BP QW (22), KV4AA, KX6AF OA4FT, UA6KFC, UR5KGA, VK9XK 10, VP8s 2GL (70) 10, 28I (14), 6RG 7NG 9C, VS2DF (30) 16, XE8 1A 1Y 2F 2PA YO3RE, ZCs 41P, SAL 11-12, ZM6BB/mm (5) 15, ZS8C and 9G1B.

80 c.w. s.t. barrier begins to separate the adult males from the juveniles. W1DWB, W4s KFC UWA/2, W8YFJ; K4ELG, K6s QHC and SXA set their noise-peak limiters and dragged through CN8GU, EA4GA, HH2KU, JA8 1VX 8AH, KH6LJ, KZ5WU, PJ2AN, VK2GW, VP8s 6RG 7NG 9CR, XE2s FA HH, British, French, German, Swiss, Czech and Dutch customers.

160 c.w. matters are at the post-mortem stage except for the most dedicated schedule-keepers. Doing on 1.8 Mc. in March and April featured KH6LJ QSOs with W4KFC, KX8XA and other mainlanders; a nice long-haul job between W7EMY and VP7NG; and contacts by HH2KU with W1KFC and other DX Test multipliers. W1BWB pulls the switch on the 160-Meter DX Test Bulletin series for the summer, periodicals to which "How's" is much indebted for coverage of 1.8-Mc. transpirations over the past few months. A rough season, but well done!

Where:

South America — If you've been behind the door during 1958 Fernando de Noronha activity you would be wise to check your PY7 QSL file dating from 1949. PY1CK lists previous Fernando radiations by such PY7s as ADW DQ and EX. By the way, the regular prefix for the place continues as PY7 until PY8, also sought for Trindade, is officially adopted. — G8KSb urges us on Falklands and Dependencies developments: "VP8s BR BS BR BT BY CE and CJ are due for QRT, VP8s DA, So. Orkneys, and CZ, So. Georgia, will be available. VP8s CQ CT and DB are active from So. Shetlands, while VP8s CF CN CO DG

A scant 445 miles from the North Pole, this snug shack housed VEBAT on Ellesmere Island at 82°39'N-62°41'W until a few weeks ago. Earle now is back in comparatively balmy Whitehorse, relinquishing title as Canada's Most Northerly Ham Station to VE8s ML and NS, both about 449 miles from the Pole. While on Ellesmere VEBAT tried his DX hand on 80 through 10 meters, also snooping a bit on 160 and 6, but traffic responsibilities command most of the operating time available to amateurs in the Far North.



DH DI and DK are on the air in Grahamland, VP8s generally are clear of scheduled work after 1900 GMT and find that Europeans usually can QSOd between 1900 and 2100 GMT on 14 and/or 21 Mc."

Africa — W4IYC holds the log for VQ4EO's spring a.s.b. esafiri as VQ3EO, VQ5EO, VQ4EO/QQ5, VQ4EO/FQ8, VQ4EO/FE8, VQ4EO/ZD2, VQ4EO/ZD1, FD8DZ and FF8DZ. While Paul rests up in England W4IYC responds to QSL inquiries bearing a.s.b. and full QSO details.

CDXC funds WIFH distributing cards incoming from VQ8AS/VQ8ASR. If you anticipate one of Ron's Rodrigues convincers, ph Chas, with a.s.b. — VQ2RG, ready to file for DXCC with 110 confirmed, tells W8KX, "I'm returning your ICRs — I QSL 100 per cent but never use 'em."

W2HBV is apprised of pirate 14-Mc. c.w. activity involving CR6BU's call. — Ex-FE8AE comes through with a QSL for W1Ts from France (holiday QTH in Jan. '58 QST) and advises Don, "I intend to leave for New Caledonia in late June or early July."

Regarding his projected DX work from Tanganyika, Kenya, Uganda and Nyasaland this summer ZE3JO assures, "I will QSL 100 per cent upon my return to Salisbury." Many will remember Mal as VQ1JO. — Handling Yank QSL matters for ZD3E, W8EWB informs, "I have his log dating from December 14, 1957, and will be receiving weekly transcripts from now on." Accord Clyde the customary self-addressed-stamped-envelope courtesy. — WGDXC hears that ZD9AF's outbound mail shipments are fairly frequent but Dave's incoming deliveries average only four per year.

Asia — OK1JX files the JTIAA log solid from January 25th to March 10, 1958, and requests via WGDXC that all correspondents include full contact data. — WVDXC relays a suggestion from ex-YI3AA that QSLs for Iraq HNs, at least for the present, be shipped only via RSGB — UC2AF hints that he may be able to assist in the acquisition of UM8KAA confirmations.

Oceania — W9NTJ/KG6 closed down in May in favor of a West Coast location. "At present I'm not sure I'll be able to operate from the new duty station but if I do I'll surely watch for all the gang from there. Anyone who missed out on a deserved W9NTJ/KG6 QSL can reach me through my Indiana address." — KC6UZ mentions that W/As are not permitted to operate fixed-portable/KC6 or KX6. "The Trust Territory is not a territory or possession of the United States and has no agreement for reciprocal amateur operation. For ham purposes the T.T. is a foreign country where permission to establish and/or operate a station must be obtained from the Territory government."

"So far I've QSLd 100 per cent," writes KR6BW (W6PWQ). "But returns from Stateside stations have been poor, mighty poor." Let's get with it, now. — VK2EG is said to be fulfilling VK1GA QSL obligations and is also hard at work assisting the current VK9 gang in similar matters. — VK6EJ, who farms 5000 antipodes acres, observes, "I formerly QSLd all new contacts 100 per cent but, not having an office staff and desiring to spend more time on the air, I now QSL only on receipt of cards or when specifically asked to do so." Fair enough.

Europe — "Anyone still needing my Crete QSL can reach me at my new Los Angeles address," ex-SV8WQ writes W1IIEK. Same follows. — W8JSU (ex-W2RDK) is told by FDQV/FC that some 500 Corsica QSLs now are en route lucky brethren with more to follow. Raoul recently came by 6000 blank pasteboards, previous lack of which held things up. W8JSU adds, "Over the years I've found, no matter how poor one's command of the other fellow's lingo, he gets a big boot out of your flinging it at him. Does wonders for the QSL percentage. No Swahili here, though, so I still need a card from ZS7."

— Moving back across the Channel, DL2YU writes, "Although all contacts have been QSLd I'll be delighted to send another card direct to anyone who forwards QSO details via RSGB."

GM3KHH, a 160-meter specialist, reports receipt of QSLs accruing from 21- and 28-Mc. activity by a call-thief. "One more batch and I can just about claim WAS!" Bill does verify all genuine GM3KHH contacts.

Hereabouts — "Have QSLd all stations I worked while operating KG1BB," avers KG1CK/K2VCT. "If by chance I goofed, anyone who finds they have not received a due card can reapply to KG1CK." Bud keeps the latter call warm around 21,120 kc. — Donors of the following individual items include W1s API, AZW, BIL, EKU, IKE, JYH, TS UED WPO, W2s ATC CTO HMJ SHZ SQT, W3s EOK, LEZ PA, W4s KFC NIX ZQ, W6s CG KG RLP, W7s C8W SUI, W9s DMY, ERU, JUV, LNU, W8s BSK, QGI, K2s BJA, PIM, SFA TEZ VAB VOM, K4s ELG, MOB, RJM, K5s AUZ ESW, K6s COP SXA TXA ZDL, K9ELT, DI4YK, F7CO, KC6UZ, VE1PQ; DeRidder (La.) DX Club, Hamfesters (Chicago) Radio Club, Japan DX Club, Nowark News Radio Club, Northern California DX Club, Southern California DX Club, West Gulf DX Club and Willamette Valley DX Club. Help yourself!

BV1TC, House No. 8, Lane 22, Kirlin Rd., Taipei, Formosa C1A, Radio Peiping, Peiping, China
CE2IJ, Box 4184, Valparaiso, Chile
C03IGY, c/o U. S. Embassy, Havana, Cuba
CR4AH, Nuno, Sal Airport, Cape Verde Islands



PY1CK/1, studying DX in this Fernando de Noronha schoolroom, passed his course *summa cum laude* by collecting some 800 QSOs with amateurs in 85 countries during a ten-day January stay. Kibitzer **PY7SC**, one of several amateurs permanently stationed on the island, appears here with Flávio's DX-100, Phillips receiver plus converter, and allied apparatus. PY1CK and other Brazilian DXpeditioners now work at activating Trindade Island, an even more remote volcanic speck on the Atlantic missile-testing range. (Photo via W1WPO and W0YFE/W0YJU)

GT2AL, Box 29, Ponta Delgada, Azores
DL2s AD ZX, Hq. 2TAF, Moench-Gladbach, Germany, BFPO 40
ex-DL2YU (via RSGB)
ex-DL4WK, Maj. M. S. Arbogast, SFAAT Army Section, USA ELM, MAAG, Taiwan, APO 63, San Francisco, Calif.
DL4YK, SFC E. F. Diehl, Jr., Det. 2, U. S. Army Logistical Command, APO 19, New York, N. Y.
EL59D, USOM, State Dept. Mail Rm., Washington 25, D. C.
FD80Z (via W4YJC)
FF8AJ (via W2AVY)
HA1KSA, Box 185, Budapest 4, Hungary
HA5AM/ZA, Box 185, Budapest 4, Hungary
HH2DD (via W2LEJ)
HK7LX, E. Quinones, P. O. Box 70, Bucaramanga, Colombia
HL2AM, Box 35, Hq. 314th Air Divn., APO 970, San Francisco, Calif.
HL2AW (via HL2AJ)
HR1BL, Capt. Lady, c/o SAHSA Airlines, Tegucigalpa, Honduras
IIDPA, US DOCO South, Navy 510, FPO, New York, N. Y.
IIDPB, CO, USA Support Command, APO 19, New York, N. Y.
IIDPC, CG, USA SETAF, APO 168, New York, N. Y.
IIDFD, CO, USA Missile Command, APO 231, New York, N. Y.
IIDFE, Cmdr., 7227 Support Gp., APO 251, New York, N. Y.
ex-JRAAA-HL1AA-DLALU, Lt. Col. G. M. Blencoe, Hq. USA SETAF, OSO, APO 168, New York, N. Y.
K2ZSB/KP4, V. Lopez, CAA, IATCS, International Airport, San Juan, P.R.
KG6AM, A. Travis, Koror, Palau, W. Carolines
KG6AN, A. K. Leong, U. S. Weather Bureau, Truk, E. Carolines
KM6BJ, T. R. Woods, Box 18, Navy 3080, FPO, San Francisco, Calif.
KX6BF, T/Sgt E. M. Ros, 1253rd AACCS Sqdn., APO 187, San Francisco, Calif.
KX6BY, Enyu Island Radio Club, Task Gp. 7.3, APO 187, San Francisco, Calif.
KX6CA, M. E. Meredith, Jr., USCG Loran Stn., EBEYE, Navy 824, FPO, San Francisco, Calif.
KX6Cb, D. B. Witter, Project Betty, Navy 824, FPO, San Francisco, Calif.
KX6CD, E. L. Parsons, EG & G, Proving Gnds., APO 187, San Francisco, Calif.
QOSIG, Box 94, Jadot, ille, Belgian Congo
PY1CK, F. Serrano, Caixa Postal 5292, Rio de Janeiro, Brazil
PY0NA (to PY1CK)
PZ1AQ, L. Henning, P. O. Box 494, Paramaribo, Surinam
PZ1AR, P. O. Box 12, Paramaribo, Surinam
ex-ST2DB (to 9G1AAA)
ex-SV8WO, S. Fason, 4811 W. Slauson Ave., Apt. 27, Los Angeles 56, Calif.
TG7SS, Mission, Santa Elena, Peten, Guatemala
T12RLA, P. O. Box 4405, San Jose, C. R.
T12WD, P. O. Box 240, San Jose, C. R.
UC2AF, Box 71, Minsk, U.S.S.R.
VE8NC, HMCS Nonsuch via Edmonton, Alta., Canada
VK9JF, Cocos-Keeling Gp. (via W6GPB)
VK9MK, P. O. Lorengau, Manus, T. N. G.
VK9RO (via W1A)
VP2GL, Box 44, St. George's, Grenada, B. W. I.
VP3CR, Capt. K. N. Harding, 160th ABW (HEDRON), APO 850, New York, N. Y.
VQ3-4-5JO (to ZE3JJO)

VR3O (to G3EMY or via RSGB)
VR3P, TFPO PA170, Christmas, Line Islands via Honolulu, Hawaii, T. H.
VR3Q (to G3YD)
VR3R, BFPO 170, Fanning, Line Islands
VS1BB/VS9 (to VS1BB)
VS5JL, BPM Ltd., Seria, Brunei
W3PZW/KR6, R. Young, CAA, Canton, Phoenix Gp. (or to W3PZW)
W0WY/KS6, General Delivery, Wake Island
XE2PW (to A.M. (via XE2JK)
XE8CDJ (to W7CDJ)
XW8AI, Agastin, ECMT/FAL, Vientiane, Laos (or via REEF)
Y1AAA, c/o ISWL, 80 Barrenger Rd., London N. 10, England
ZAIADG, Box 19, Tirana, Albania
ZAIKB, Box 42, Tirana, Albania
ZB1SS, Royal Marines, Married Qtrs., St. Patrick's Bks., Malta
ZD3E (W/K via W3EWB)
ZL1NG, T. H. Phillips, 7 Bannerman Rd., Grey Lynn, Auckland, W. 2, N. Z.
ZS6J/T/ZS6J (to ZS6J/T)
4S7WB, W. Perers, 142 Lewis Pl., Negombo, Ceylon
5A4TJ, Box 638, Tripoli, Libya
5A5TK (via CNSFD)
9K2AQ (via RSGB)

Whence:

Europe — Those new IIs with Yankee drawls are stirring a storm on DX bands this summer. Thanks to successful negotiations with the Italian government our Southern European Task Force has licensed several installations in that country. W2s NVR ZSO, K2MZT, W4HYU, W6FZE, KE9WQ GBY KGP, W7AIU, K7BPI, W9ESM, K9BDV and KL7QQ are among Italy-based beneficiaries. A maximum input of 300 watts is permitted on 3613-3627, 3647-3667, 7000-7150, 14,000-14,350, 21,000-21,450, 28,000-29,700 and 144,000-156,000 kc. W1UED understands that FCC General and Advanced tickets can qualify military, army-employed civilians and tech-rep personnel for II operations. U.S.S.R. chatter via UC2AA, UB5DW and W5CAN. There now are some 3800 Russian amateurs on short-wave bands and an additional 3500 using h.f. Some call signs end in YLs are UAs 1BM 1KA1 3CU 31T 3KAM 3KKB 6KAC 9DA 9KAD 9KSB, UB5KKA, UF6AM, UI8e AP KAA KBA and UQ2AG. Certifications are popping up here and there, such as Central Radio Club's P150C (similar to DXCC), Worked-100-Sverdlovsk, Worked-6-Continents and Worked-10-Minsk. . . . A typical "U" radio band's progress includes (1) passing a code test for an a.s.c. license, (2) appointment to staff membership at a club-collective station, and (3) qualifying for a personal (private) call sign and station through passing further examinations and securing necessary sponsorship. . . . Radiotelephone privileges are granted only to the most experienced and proficient 1st Class U.S.S.R. licensees. . . . UA3KAA of Moscow's Central Radio Club performs bulletin-transmission service for Russian hamdom and is audible hereabouts on 14,100 kc. at 0500 GMT — WGDXC understands that SW9WN/Crete will remain active there at least till mid-'59. . . . DL4s TO and ZO intend DL4-TO/LX DXpeditionary doings around this time. . . . DM2ABB directs attention to WADM, an East German certification of world-wide availability based on the accumulation of DM band-district QSO points for contacts dating after July 14, 1953. Minimum requirement calls for 20 points and 10 different districts, the latter indicated by the final letter in each DM's suffix (A for Rostock, B for Schwerin, etc.). Write award chief DM2ABB for the full story.

Asia — G3JFT (ex-YI3AA) writes WWDXC from Habanibani that a parity with service licensing authorities was successfully concluded in early 1958. Brian and another G applied for permits and hope to be signing HN3AA and HN3BS, respectively, the former expecting to run 15 watts to a 5763 on most DX bands. . . . W2CTO relays the

current 9K2AN operational routine: 14,050, 14,070 or 14,098 kc. from 2130 to midnight GMT; 14,070 at 0400-0500; and 14,098 again around 1430-1600. The program is subject to modification by Kuwait's torrid temperatures.

Joining Israel's 10th anniversary observations, IARC is sponsoring a DX marathon to run from April through October of this year. According to *Israel Digest*, 4X4 will try to contact the greatest possible number of amateurs abroad, and vice versa. "There will be one winner from each continent, three winners from each country and ten winners from Israel."

KoVAW angles for a berth with the Burbank Youth Symphony due for a Korean tour this season and, if fate smiles, will pack a compact a.s.b. outfit. Roughly epitomizing a survey by Japan's *Radio Experimenter* forwarded by K6DV and JAICV, we see that about 80 per cent of JA ham receivers are homespun. An antenna poll favors the long-wire, standard doublet, yagi beam, sepp, vertical and folded dipole in that order. Final tube types find the 807-1625 unchallenged in popularity, a 10-to-1 favorite over runners-up 832A and 2E26 bottles.

W6RLP discovered ex-VS1GY sounding brass as ZL1AÖV and learns that ex-VSHJ now signs G3MDI back home in Manchester, U.K.

Via 1SWL: Kandahar's YA1AA, intermittently active since last September, now has two operators to keep it KWS-1 and 75A-4 warm between 1500 and 1800 GMT although Afghanistan power sources continue notably unreliable.

DL4BL visited Turkey this spring on official business and found hamming possibilities nil.

Africa — Visiting ZS8K's antenna farm, ZS6AJ/ZS8 kicked off the DXpedition season down Basutoland way by collecting 116 contacts in March, many with W/Ks. W8YIN, No. 1 contact for Jack on this jaunt, is told that ZS8K plane a.s.b. this year.

W8IBX notes that CNSHUK, a co-op manned by C/Ns 1B IV HX and others, specializes in Statesiders on 28.178-ke. phone. Pray respect the gang's directional CQs. During the period June 7th to July 14, 1958, I intend a photographic-hamming safari as ZE3JO/P (ZD6), VQ5JO, VQ4JO and VQ3JO, stopping in game reserves for several days at a time. I'll be using a 20-watt B2 transmitter/receiver on c.w. and a.m. The antennas? As much wire as I can erect. This from ZE3JO, and Mal will augment this gear with more potent paraphernalia if the opportunity arises.

VQ2RG shows on 10 c.w. around 2200-midnight GMT when possible,

pursuant to WAS and chats with such favorite North Americans as WSKX.

W6RLP and others are intrigued by the spring 28-Mc. c.w. fad inspired by ZD78A:

St. Helena Roulette. Despising zero-beaters and tail-ending,

Bob, usually found near 28,000 kc., is likely to answer calls

anywhere from 28,000 kc. up into the phone subband. There

are two vociferous schools of thought on this procedure,

each of which argues with some merit. No. 1 favors this

m.o. as a means toward more equitable QSO distribution

among the power levels while discriminating against over-eager beavers. No. 2 votes against the practice because of

decreased over-all QSO rates and a tendency to spread

chaos and QRM throughout an entire amateur band.

What's your brand?

VQ4EO, rolling across 8000

tortuous and torturous miles of Africa in a British Land

Rover, tallied some 2000 DX QSOs from nine countries

this spring, most on single sideband. One must agree with

W4IVC: "I think it was quite a feat for one man. Roads

are nonexistent in some places and Paul tells me that on

many occasions the only thing that never failed him was

ham radio and the fellows in the States who were tracking

him."

Oceania — Certification-seekers should be interested in the Coral Island (Guam) Radio Club diploma available to those who contact three or more members after January 1, 1958. W9NTJ/KG6 lists himself, K2ILQ/KG6, K9TSQ/KG6, W6IVL/KG6, KG6e AGK AGW AGX and AGY as active possibilities. "QSLs are not necessary, for logs can be checked here."

VK6EJ seeks Del., Idaho, Me., Nev., the Dakotas, Utah and Vt. to complete an inside 48

Straight. Jack fires his trusty 807 into antennas ranging from 500-foot Vees to parasitic rotaries, receiving with a BC-348 and SX-17. Power is self-supplied, a two-h.p. petrol-pushed 230-volt source. VK6EJ's junior op, a handy

guy to have around, enjoys constructing the OM's steel towers and bug keys.

As verified by W3ZKH and others, that ZM1BL still passes out quite a line on 10 meters, apparently acting as Oceania's answer to South America's 24AA.

W2HJM finds VK9XM assisting ZC3AC's Christmas output, and VK9BB aiding VK9JF's Cocos-Keeling efforts, all on 20 c.w. and Aug still stalks elusive V84BA near 14,086 kc. at 1300 GMT. Sundays

VE1PQ finds that VE2R formerly signed VE2AQQ on the Magdalen Islands in the Gulf of St. Lawrence. Booming Line Islands amateur activity now poses a local QRM

problem at a spot heretofore quite rare.

Similar difficulties down Antarctica way, judging from WIA's *Amateur Radio*: "Individual ham activity at Mawson Base may have to be curtailed due to the large number of hams in this year's party; a roster sharing the limited time seems to be the only solution. Mawson's main transmitters are in operation for approximately 15 hours daily, another factor to be considered." Mawson is home to VK9s BC DA IJ PK

RA RB RO and RR, Davis Base shelters VK9s AT and PT, and Macquarie is represented by VK9s HK KT and TC.

KR6BW struggles for more Novice QSOs but the going is rough on 15. "Also tried 80 meters but so far I've heard nothing but commercials."

W1JYH bumped into K1DHD pumping r.f. our way from KX6BP.

Hereabouts — Fernando pointers courtesy W6YFE/

W6YJU, W1WPO and PY1CK: PY7SC will keep a 32-2 warm on 14, 21 and 28 Mc. now, mostly phone; PY7AFN expects to use 7- and 14-Mc. c.w.; PY7s BAB BAD and LR, also stationed on Fernando de Noronha, cling to 40-meter phone. Airman PY1BNU is transferring to the island and may become PY7BAE.

KP4KD, a cool key man from 'way back, will complete requirements for radio-telephone WAS of all things, where he corrals Utah.

KJ1GN has FY7YH relocating to Martinique with his 90-watter and NC-98.

W4 AIS, BPD and CYV continue to batten each other with local Carolina QRM in the 20-meter donnybrook.

W8KPL, whose much-used 10-year-old 813 shows signs of fatigue, figures he's qualified for DXCC² after auditing his voluminous QSL file.

W4QRQ continued Caribbean a.s.b. peregrinations through April. Operational sorties at VPs 4TE and 5RS produced tallies of 300 and 200 QSOs, respectively.

W4KFC reports that the big East Coast snow job in late March put W3s GRF and MSK out of order for the final ARRL Test sessions, and other DXers acknowledge extensive skywire damage in that mushy blow.

HR1EZ returned to Uncle Sugar, turning his 3-el. spinner and 20A exciter over to HR1JH.

K7AYU grants Wyoming contacts on 21,300 kc. during daylight hours and on 7250 kc. at night.

Cuba's Matanzas Radio Club offers a certification that calls for ten CM5/C05 QSOs dating after February 9, 1958. For full details consult RCM at Bajos del Palacio Provincial, Matanzas, Cuba.

W1QMS/VE1 (A3) and W1UXK/VE1 (A1) will dispense P.E.I. contacts from the 5th through the 12th of next month on bands 160 through 6 meters, mainly on 20, DX-10, HR-50, Gonset II, TBS-50C and HQ-129X equipment will perform.

W1AZW made it 130 worked with his scrappy little 30-watter.

While functioning as Canada's far-north ham during the winter of 1957-58, VE8AT found conditions as follows: "Seventy-five meters was open most of the winter with lots of VE8s round-tableting; 40 was not prolific; 20 proved usable almost around the clock and bore the brunt of traffic work as well as DX efforts; 15 and 10 stayed in only for two or three hours at a time. I extend a large vote of thanks to the 14-Mc. W/K/VE gang who passed up DX regularly to handle all our traffic. Swell job."

K6ZDL searches for data on the present whereabouts of 1957's VS1HC. W7VY beseeches all for current dope on ex-EP1s RY ('45) and AL ('47), and W8DLZ desires HZ1HZ and UJ8AF QSL hints.

Ohio Valley Amateur Radio Association's March KCAF fireworks produced some 7 kilocontacts with 80 countries, plus another thousand maritime-mobile QSOs.

Hair-raising landing difficulties, a critical water shortage and frying temperatures failed to sag the DXpeditionary spirit of the club's Navassa task force, W4KXW, W8E EZF FGX and RSW. Wrangle next, fellows?

(Continued on page 178)

UA1DG is a call not unfamiliar to North American 21- and 28-Mc. DX devotees, for Anatol persistently pursues his WAS on those bands with a 50-watt transmitter, ground-plane antennas, Super-Pro and Koen receivers. Son Albert signs UA1FE and 12-year-old son Toly diligently listens as s.w.l. UA1-604. UA1DG is one of a dozen amateur stations located at Peterhof (Petrodvorets), site of Peter the Great's palatial estate just outside Leningrad.

(Photo via W1VGC and UC2AF)



Strays

The daily newspaper is often an excellent source for our file of Strays. One recent news story reported on a couple of Novices who worked daily with vacuum tube volunteers and other complex equipment, while in another paper there was offered for sale a 45 Wyatt amplifier.

On the other hand, sometimes we are the ones who are fooled by the terminology. One of last month's Strays joked about the fan that reportedly spread microwaves around in an oven. Well, by gosh, W1YLB and K8ERV have both written in to say that that is exactly what *does* happen. The fan is called a "stirrer" and its purpose is to reflect the microwave energy in many directions so that "hot" and "cold" spots are avoided.

W2CZX, of 109-14 139 St., Jamaica 35, N. Y., is trying to obtain some old W2EPM QSLs. Prior to 1942 this call was issued to Paul Pfeffer. Mr. Pfeffer's daughters would like the



Col. George J. McNally, W3NAL, commanding officer of the White House Army Signal Agency, addresses the Dayton Hamvention Banquet on "The Amateur and Communications for the President of the United States."

Photo by R. L. Gallagher

cards as souvenirs and W2CZX is helping.

ZL1MS reports a bit of phone nonsense he overheard one night. A ZL2 stood by with the remark that, "Well, OM, we'll say goodnight to you and your good wife — we are single here. . . ."

K2GMZ successfully administered the Novice exam to the 80-year old father of W2ZS.

To celebrate British Columbia's 100th birthday this year, an expedition has been organized to climb Mount Fairweather. The call VE7BCC has been assigned to the expedition and VE7ALE is organizing communications. Besides the usual expedition communications, the station will be active on both phone and c.w. Contacts will be confirmed with a special Centennial QSL. Look



The South Plains Amateur Radio Club of Lubbock, Texas, has prepared an Amateur Radio Historical Exhibit for the West Texas Museum on the campus of Texas Technological College. Here are W5KTX and W5KCP examining an old relay and a spark-gap transmitter that have been loaned for the exhibit.

for VE7BCC on the air between June 14 and July 13.

Now we have another claimant for the longest QSO of record. K2SVL says that he and K2UVM maintained contact for a solid even thirty hours on August 3-5, 1957, using two-meter phone.

Radio amateurs in Union, N. J., are helping to celebrate Union's Sesquicentennial by plenty of mention of the anniversary on the air. Special QSLs have been printed for 21 of the hams in town, and a ham station will be set up at the local high school during July as part of the general Sesquicentennial exhibit.

Home who receive signals bounced off the moon by the U. S. Army Signal Engineering Laboratories, Fort Monmouth, N. J., and report them, get this acknowledgement card. The space-age method for tuning radios to satellite frequencies is part of the Project Vanguard program.

The card was designed by W2KJR.

Operating News



F. E. HANDY, WIBDI, Communications Mgr.
GEORGE HART, WINJM, Natl. Emerg. Coordinator
PHIL SIMMONS, WIZDP, Asst. Comm. Mgr., C.W.

ROBERT L. WHITE, DXCC Awards
LILLIAN M. SALTER, W1ZJE, Administrative Aide
ELLEN WHITE, WIYMM, Asst. Comm. Mgr. Phone

How Not to CQ. In one week of operating KN4TDX reports hearing a CQ sent in tortured code in four different ways . . . NNQ, KEQ, CMA and CGT. He writes, "It really would be most interesting if all operators could *hear themselves as others hear them*." Undoubtedly it would give us a more outstanding or utopian amateur radio too, at the least some better fists!

All experienced amateurs have observed that such poorly spaced code is bound to draw many fewer replies. Operators with good fists as well as good stations are discriminating, value their time, and are looking for operators to work who have, through practice or experience, achieved a higher degree of operating proficiency than shown in such distortions of the intended calls or characters! May we suggest some private critiques in clubs and code groups in which we frankly tell each other which letters are incorrectly sent. Some tape recording and listening-back can help a fellow recognize some of his own defects also. We also suggest consulting those published dates of W1AW code runs when we follow *designated QST* text accurately. Rigging up an oscillator or buzzer to a hand key and trying to key in step with the W1AW tape as you listen can help a lot in overcoming the errors that must not become habits. Work on poor spacing and any characters not perfectly formed. Soon you will be sending clear and readable code. You will be surprised how clean sending can step up your number of contacts and results.

73. Originally published in a U. S. Naval Operations Bulletin, the following from April 1934 *QST* will answer many questions of current day amateurs about "73." "Many have often wondered where the telegraphers conventional signal of greeting, '73,' had its origin. It dates back to the early days of telegraphy. During the Civil War, Andrew Carnegie administered both the telegraphs and the railroads. Shortly after the war the Order of Military Telegraphers was organized. The members of this order had a fine 'esprit de corps.' During the Civil War, telegraphy was just as new as radio was during the World War and the operations of armies depended in a large measure upon the intelligent use of the telegraph. Upon Andrew Carnegie reaching the age of 73, the Order of Military Telegraphers gave him a testimonial dinner and from this the term '73' came into being as a symbol of good wishes."

Amateur Operator License Suspensions. Additional Public Information releases of the Federal Communications Commission record the following license suspensions:

FCC ordered (March 13, 1958) that the Technician Class amateur operator license of Robert L. Kreps, Blue Island, Illinois be suspended effective from April 1, 1958 for a period of two months, that the license be turned in to the FCC and K9CTA not be permitted to be operated by any person in the 60-day period, *it appearing that the licensee on eight (specified) different dates during 1957, operated K9CTA in the 1800-2000 kc. frequency band, using A-3 emission, contrary to the terms of his license and in violation of Sec. 12.23 of FCC rules; also it further appearing, that said licensee on these dates and while engaged in amateur operation, failed to keep an accurate radio station log, a violation of Sec. 12.136.*

FCC ordered (March 19, 1958) that the Technician Class amateur operator license of Denie Canton, Miami, Florida be suspended effective from April 8, 1958 for a period of two months, that the license be turned in to the FCC, and K4HFV not be permitted to be operated by any person in the 60-day period *it appearing that the licensee on various occasions and on June 7, 10 and 11, 1957, operated the transmitters of amateur stations K4HFV and W4IDJ on the frequency 7200 kc., using A-3 emission contrary to the terms of his license and violating Sec. 12.23 of FCC rules, and it further appearing that licensee failed to maintain an accurate radio station log, violating Sec. 12.136 of FCC rules.*

Come to think about it. Interference is the common complaint of practically all hams, especially those newer to the bands we all share. For the Novice with one crystal, the acquisition of additional crystal frequencies offers some escape from the fantastic QRM that sometimes limits his results. Surveying our band occupancy indicates improvement feasible just by spreading ourselves more uniformly throughout all our amateur holdings. Contest operating sometimes starts "from the low edges." Using any old band for any old distance may get by, but intelligent operating calls for use of the best-suited band for a given distance, time and season.

In the summer operating period some scheduled net operations we think, could be shifted advantageously to a higher frequency band or else the hour changed where work schedules permit for better reception of all the net signals in the given area. But how to cut interference?

Short calls have often been emphasized in these columns. Cut out the long ones. If a fellow tunes to your signal he'll hear you on a short call. Or if he fails to tune to your signal of course he'll never hear you on the long call either, and the short one is a time saver.

Zero Beating. It should not be necessary to point out the virtues of zero-beating for convenient tuning, as well as conservation of frequency, for all members of any net. The same applies to each pair of operators keeping a schedule. It helps the two operators and *all others* to be precise in the matter of zero-beating signals. We live in a time when most seasoned operators have

reasonably good equipment, stable v.f.o.s making this desirable technique possible. Cultivating correct operator procedure to accomplish quick and accurate zero-beating is something to work for though!

The usual fault, we think, is in an operator's failure, when zero-beating, to first set his receiver to *true ZERO* with his antenna off the receiver. (To zero the transmitter with some audio frequency pleasing to the ear to copy but not first putting the receiver to the point where it is zeroed with the incoming signal, results in setting the transmitting frequency to that audio difference with the net frequency!). The Detroit Amateur Radio Association's *QMN Bulletin* humorously suggests the possible designation of a brand new Q signal (for netters that can't zero or QNZ the net frequency) to indicate: I HAVE NOT USED A COHERER FOR SEVERAL YEARS AND YOUR SIGNALS ARE WELL OUTSIDE THE PASS BAND OF MY RECEIVER.

Got Your Worked All States Award? During 1957 ARRL issued 1452 WAS certificates. This represents an increase of 15 per cent on the year; interest was *already* at a high point. Working all states is a significant operating achievement. Practically all FCC licensees aspire to this award, and many amateurs in other countries additionally have their eye on it. The fact that 12 per cent of the certifications go to amateurs outside the United States and Canada is an indication of the growing interest of amateurs all over the world in working all the states for only about 28 per cent of the world's amateurs are in other countries. Some amateurs right at home take years to get the QSLs from the "more difficult" states such as Utah, Rhode Island or Delaware. On the other hand the more ardent newcomers sometimes make WAS by unremitting efforts during their first apprentice year.

Mixed-submissions of phone and c.w. cards may be presented for our award, or your work accomplished in one band or all bands may be submitted likewise for WAS. *It is not necessary or desired that the work be accomplished on a single band or by a single mode.* We occasionally on specific request type on the award a statement for all-phone or all 3.5 Mc. work, if such is the case and your cards indeed all show such confirming evidence. We never endorse that work was accomplished with a particular equipment, or specific power level or such things that obviously are either beyond our ability to check or in any case beyond the scope of the written evidence in any degree. *Operating Aid No. 8* continues to be available as a form to assist in placing your states in alphabetical order when submitting the cards direct to ARRL for WAS.

Some pointers on submitting for WAS. There are a couple of points concerning WAS that we wanted especially to mention, to fore-stall numerous questions. A move of less than 25 miles comes under the definition of "one location" for WAS purposes. Cards received before and after a move within this limit may be used as confirmations. Novices whose call prefix changes

on receiving their General Class tickets may submit QSLs received before and after this call change, as long as their work continues to go on from the *same location*.

To summarize, if you are versatile and use all bands and modes you will probably get your WAS much faster than if you insist on one kind of amateur radio only. Moving your station about is permitted within a 25-mile radius. It's best not to include *any* mobile work cards with your confirmations sent in for WAS; if you send such a card then you must certify where you were for that contact in proof that it comes within the 25 miles of your home station. While speaking of mobile, your capability to *drive* to the 48 states after your cards may be fun. Mobile all over the U. S. A., however, is *not* rewarded by a WAS, since it isn't the same achievement as earning one from your home location! A postmark may help identify a card not otherwise identified as to source or location by its originator. Postmarks, however, are *not* a requirement; much of the mail these days goes through QSL bureaus anyway. Before you send them in be sure your QSLs each have all necessary data on them to confirm a QSO. If you send us in 48 cards and some do not show your same call on each, you should, if you expect credit, explain the circumstances. Give the dates and locations when you used the calls involved, also straight-line distance between the two points, if work was not all from one residence or location. Good luck in going after your WAS, if you haven't this certificate in your shack.

W1AW Goes to 1820 kc. Because of the change in general use of the 160-meter amateur band due to its expanded use for Loran, W1AW has had to shift its operating frequency from 1885 kc. to 1820 kc. The full current W1AW schedule (page 100, May *QST*) could not reflect this, but for Official Bulletins, our 160-meter General Operating Period and Code Practice, look now for W1AW on 1820 kc.

Your comments on our proposal to discontinue sending Code Practice addressed to amateurs on this 1820-ke. frequency are requested. In view of a prospective increase in general amateur occupancy of this 160-band sector, and the ability of users of our tape-sent code-practice to receive W1AW on 3555 kc. and our other designated frequencies a further change is planned for June 30. W1AW will maintain the Bulletin Service to 160 users, but discontinue the hour of 1820 kc. practice normally starting at 2130 EDST daily, effective June 30, unless a large number of users before then indicate the wish that it be continued.

NATIONAL CALLING AND EMERGENCY FREQUENCIES (Kc.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50,550	145,350

With the AREC



It is natural enough for civil defense officials to misunderstand the aims and purposes of RACES and to think that they have the right to use the RACES segments of the amateur bands in a manner entirely to suit their own aims and convenience. But when amateurs themselves begin to adopt the attitude that RACES is civil defense and not amateur radio, it is time that we begin to examine among ourselves just what RACES is, what it is for, why it was established and how it is supposed to work.

Perhaps the best way to conduct such an examination is to start out with a very basic question: What is amateur radio? Is it a mass of irresponsible hobbyists bent on their own enjoyment? Is it a training ground for operators and technicians, a place to get their feet wet until they can step into better things? Is it a military reserve of operators, technicians and frequencies? Is it a playground for persons commercially engaged in electronics? Is it a "no man's land" of personnel and frequencies ripe for exploitation by whoever can offer its occupants something that will attract them? Is it organized, unorganized or disorganized? Is it beneficial or inimical?

To some extent it is each of these. Who can deny that a great many amateurs are interested only in enjoying themselves? That many who start out as amateurs "graduate" to better things? That the military reserve aspect is a very important one in retention of the frequencies we use? That many commercial radio people get amateur tickets so they can "play around"? That many agencies exploit amateurs and amateur radio for their own selfish ends? That some of it is organized, some of it not organized, and some of it strictly balled up? That in some respects it is beneficial both to amateur and the public, in some other respects inimical?

One thing is certain: that amateur radio is a service and must continue to be one if it is to continue to exist; that amateur radio exists at all *only* because it qualifies as a service; that it is governed by FCC regulations for the Amateur Service and by international documents that likewise refer to it as such.

RACES was developed as a means for using the Amateur Service in civil defense communications. To a great extent we were already organized for emergency communications when RACES came into being; the RACES rules, in effect, permitted us to make our already-organized facilities avail-

able for civil defense purposes where they existed, or to organize and offer such facilities where they did not. RACES is amateur radio as much as it is civil defense radio. The most beneficial service is and can be performed where amateurs go to civil defense officials with the story of what they can do, rather than to have civil defense officials start rounding up amateurs in order that they might use them and their frequencies.

Two disturbing situations arisen in recent months have brought on the above discussion. One is a case in which amateurs who are appointed radio officers by their civil defense directors are automatically appointed ECs. One amateur wrote to say that he had just received an EC certificate from his SCM, and what he wanted to know was: What is an EC? After all, he told us, his radio officer appointment was only a gimmick to allow his civil defense people to get RACES radio equipment under matching funds; presumably, he had no familiarity with emergency communication or any real expectancy to participate in it up to that time.

The other situation had to do with civil defense officials operating RACES mobile and fixed equipment outside of RACES drills, even though they had only third class operator permits, and with a proposal to use RACES amateur frequencies for triggering devices to sound sirens and other warning instruments. The disturbing thing about this was that although the amateur who called it to our attention deplored it, he also mentioned that some local amateurs not only condoned it but actually assisted in making it possible.

We have several observations to make. One is that since RACES is an amateur service (don't you forget it or allow anyone else to forget it) we have the same responsibility for self-policing in that part of amateur radio as we have in any other part, this regardless of who the offender is or what high position he may hold in local civil defense. The second is that we should resist creeping infiltration of amateur frequencies by persons or organizations bent on using them for purposes not within the intent of the amateur regulations. The third is that although amateur radio can and should become a valuable adjunct to civil defense communication, we should see that it remains amateur radio and does not become entirely civil defense radio, facilities and equipment offered by the latter notwithstanding.

The fourth, somewhat unconnected with the above but nevertheless worth mentioning, is that RACES is not the only civil defense communication facility, not the only c.d. radio facility, and in a good many cases not even the *principal* c.d. radio facility. We have our place, and it is an important place, but many c.d. officials feel that they can get along very well without us until or unless we can convince them otherwise. So let's participate in this phase of our amateur service with patience and humility, but at the same time with pride in our own organizational status and ability.

Central Texas Amateur Radio Club members took part in a simulated explosion in Waco, Texas, on March 11, assisting the McLennan County Chapter of the American Medical Society and the Red Cross in supplying emergency communications both locally and with outside points. Six meters and 75 meters were used, both s.s.b. and a.m. Here's the group with some of the gear they used. From left to right: first row, W5IL, W5BH, W5NRO, K5LFA, W5WIY; second row, W5FZB, W5TV, K5MBZ, K5COK, W5DSG; third row, W5KAU, K5BLI, W5NCD, K5CIO, K5CLG, W5TVZ; fourth row, W5VHF, W5BQO.





Ten meter net control in the Miami Valley's "Porchlight Parade" was WBFPZ, whose station (with KBPSE at the controls) is shown here. This station was linked with the main control station on 2 meters.

and determination to see that this status is recognized and our regulations observed.

Hey, fellas, how about putting dates on things you send in? For this month's column we had to reject four emergency items for writeup because three of them said "recently" and the other one said "last Friday night" without any reference date. We'd like to have our writeups tell when, where, how, what and who. Phrases like "last Friday," "yesterday" and "recently" may be all right for newspapers, but for *QST* we have to know the date for future reference purposes. Will you help us out? Tnx.

Within minutes after a snarling tornado ripped through Cochran, Ga., on January 24, amateurs began flashing word of the emergency to civil defense and Red Cross relief agencies. Since the winds had swept down telephone lines, the first word of the emergency was relayed by W4PIM and K4CZR of Atlanta. W4VVO/m was dispatched to the scene of the disaster, where he set up at the Cochran police station and immediately began relaying requests for relief supplies and information on the damage done. The state civil defense director was advised of Cochran's needs via W4BKK. Other amateurs assisting included W4s TJS YEK CFJ, K4s KEC AUM GGD and AT.

On February 16 the Borough of Tamaqua, Pa., was declared in a state of emergency because of heavy snows, and amateurs were requested to activate their stations on an emergency stand-by basis. About 15 local amateurs remained on alert for two days, handling information on road conditions and digging-out operations. Most other forms of communication were inoperative because of the storm. Two of the rural operators were completely isolated but able to convey their problems, mostly concerning food and fuel, to the borough hall by amateur radio. No assistance was needed from state level. Amateurs taking part included W3s KJJ PTM RZV ZPW IGH CMA ZXF EEE FLJ BGR ZIV DJZ PTM ZRQ. — W3ZBQ, EC Schuylkill Co., Pa.

The Mount Diablo Amateur Radio Club was called into alert by the civil defense director at 1630 PST on February 24 because of the pending flood in that area. Control station at c.d. headquarters, W6AIL, was operated by W6AIL and K6KRF. W6QEN operated at the county garage in Martinez to dispatch trucks with sandbags to needed areas. W6LGW used emergency power at his Alamo QTH and checked in net members as they came home from work. The club net operated on both two and six meters; following the regular check-in by W6OHR (on 2 meters) and W6CGS (on six meters), net control was taken over by W6AIL on both bands, after which members stood by for emergency traffic. The emergency was declared over and the nets secured at 2045 PST. The following additional stations took part: W6s EDR EFL VNI HOF FKK IHR JY2 KTF LKE PIL PIR RVC, K6s ILH IMV IRB JAV JAY KRF VPC ZPB AQ KYT OCF/m OGU RMD/6 QXY, W6UFK. — W6LGW, EC E. Contra Costa Co., Calif.

Informed that high water was threatening some dams on Rancocas Creek in Burlington Co., N. J., on Feb. 28,

Moorestown Radio Officer W2WKI made contact with K2-DGQ, who was nearest to the threatened area. A report of the status of affairs indicated the need for mobiles to be stationed at the dams and keep officials informed. By 0100 Mar. 1 K2JAK/m and K2GOK/m were on their way to the lower dams, while the county c.d. headquarters station in Mount Holly was manned by W2ESG and K2GFP. Later, relief operators W2KHW and K2KPF were sent to the sites and joined by K2SOX, K2MOV and K2VPA for further relief chores. Operation was continued officially until 0346, but most of the stations remained active through the night.

The worst snow storm in the history of Mercer Co., N. J., started on March 19 and continued throughout that night and next day. The wet, clinging snow took a deadly toll of power and telephone lines so that these utilities were greatly affected. By 1500 on March 20, Mercer County RACES was activated. From the start, it was necessary to operate the headquarters station on emergency power, and by 1830 a state of emergency had been declared. A two-meter net was set up between county headquarters and 8 surrounding municipalities, with a six-meter mobile for contact with Princeton. Portable generators and batteries were used for power in nearly all cases. All messages filed were passed through to destinations despite some necessary relays, and many new operators "got their feet wet" in their first emergency experience. Particular credit goes to W2HX, county radio officer, whose ability made it possible to operate the whole airport, where the control station is located, on emergency power; and to W2BVV, who operated from his home despite a recent operation and was instrumental in locating operators for Ewing Township when it became impossible to make contact on the land line. Thanks to K2IIW for this report.

Just to keep active, AREC and RACES units frequently participate in special activities in cooperation with or assistance to various civic agencies or police. Such activities are not only good for practice and morale, but also are good publicity. We summarize, herewith, a few such exercises that have been reported to us.

Three groups participated in Hallowe'en patrols last October 31. In Rockford, Ill., the Rockford Six Meter Emergency Net assisted the Winnebago County Civil Defense authorities using six mobile units and the c.d. communications truck for a control station, reporting direct to the sheriff from the truck's unit on 47.5 Mc.; the amateur frequency was 50.7 Mc. In Wasco County, Ore., the Dalles Amateur Radio Club cooperated with local police authorities in "Operation Vandal," this time expanding operations from last year to cover the whole county. A local police reserve officer rode in each amateur mobile unit to take care of any law enforcement problems, relying entirely on amateur radio for communications. Six mobiles participated, and the amateur group also supplied equipment to a number of points that were normally without c.d. radio equipment. The Western Pennsylvania Mobileers, a ten-meter emergency group, assisted police in Oakmont Borough, Pa., in similar fashion. Nine amateurs used their own equipment and their own gasoline for the three-hour period, while two others manned the control station on 29.360 Mc.

The Mobileers' secretary, W3ZUW, received letters from the Oakmont police chief and the c.d. auxiliary police in appreciation of their services.

On January 30, for four hours in the evening the Miami Valley (Ohio) C.D. Authority RACES and AREC operators worked with the Dayton Amateur Radio Assn. to supply 34 mobile units to help speed up collection of police contributions in a "porchlight parade" held in the area. C.D. headquarters was set up as communications center under the call W8RXM. Frequencies of 147.15, 50 and 29.6 Mc. were used with net controls on each band, all linked to the communications center on 145.23 Mc. The entire "Operation Polio" was a great success, thanks in great measure to the turnout of amateurs to assist.

In Cuyahoga County, Ohio, the AREC in cooperation with the Fifth Area Mobile Police and the Ohio National Guard participated in the March of Dimes drive on January 29. A portable control station was set up at headquarters and seven mobile units were used in seven convoys, plus three with reserve units, two for investigation purposes and one as a photographer's car, making 13 in all. Six meters was used for the entire activity and worked out exceedingly well. Thirty-four amateurs participated and received much praise from all agencies served. — *W8AEU, EC Cuyahoga Co., Ohio.*

In Memphis, Tenn., 18 mobiles operating on 2, 6 and 10 meters assisted in the Heart Fund Drive on Feb. 23. Club station W4EM was set up at the headquarters to control mobiles on 2 and 10, while K4BSR did the controlling on six from his home. A number of other amateurs also assisted. The Heart Association was very lavish in praise of the communications facilities thus provided.

On March 16, the Cuyahoga County AREC group again came out, this time to provide communications for the Easter Seal drive. Mobiles were used to pick up the money and bring it to headquarters, maintaining contact all the way. One mobile loaded with money blew a tire in a remote area and summoned immediate aid by radio. Twenty-one amateurs took part, with ten mobiles, two relay stations and one portable as net control. A total of 275 communiques were handled, all on six meters. — *W8AEU, EC Cuyahoga Co., Ohio.*

February SEC reports showed a great improvement over the January totals. Twenty-six reports were received, representing 6455 AREC members. This is an increase of four reports over the same month in 1957, and a small increase in AREC members as well. New sections heard from were R. I., Utah, Minn., Mich., S. N. J., Wash., Mo., Ore. and Maritime. Sections reporting for the second time in 1958: Ala., San Joaquin Valley, Santa Barbara, Mont., Va., N. M., Colo., NYC-LI, E. Fla., Ga., Ont., N. Texas, Conn., E. Bay, Santa Clara Valley, Md.-Del.-D. C., Wis.

RACES News

W3BUD reports that they have talked for years about RACES in St. Mary's County, Md., but now they've finally done something about it. Things came to a head when a delegation consisting of W3BCP, W3BUD and W3ZZK visited the c.d. director and asked him point blank if he intended using amateurs. When he replied in the affirmative they said, in effect, "Let's stop fooling around and get going." As a result, W3BUD got himself appointed C.D. Communications Officer, W3ZZK radio officer and W3BCP alternate r.o., and they spent the next three weeks writing a communications plan and getting a dozen local amateurs interested. They now have a ten meter net in operation and the RACES plan is on its way to approval. Civil Defense headquarters has a RACES station installed. W3ZZK is EC as well as RO.

W9PSP has sent us a map of the Illinois C.D. Amateur Radio Services, showing the locations of RACES stations throughout the state, indicating target cities, control stations, and locations of stations in the Illinois Emergency Net and Illinois CW Net; also the division of the state into 13 RACES areas. It's a very interesting and comprehensive study and represents the results of the first survey of RACES facilities throughout the state.

ARRL ACTIVITIES CALENDAR

June 4: CP Qualifying Run — W60WP
June 14-15: V.H.F. QSO Party
June 23: CP Qualifying Run — W1AW
June 28-29: Field Day
July 3: CP Qualifying Run — W60WP
July 19-20: CD QSO Party (c.w.)
July 22: CP Qualifying Run — W1AW
July 26-27: CD QSO Party (phone)
Aug. 6: CP Qualifying Run — W60WP
Aug. 20: CP Qualifying Run — W1AW
Sept. 4: CP Qualifying Run — W60WP
Sept. 17: Frequency Measuring Test
Sept. 18: CP Qualifying Run — W1AW
Sept. 20-21: V.H.F. QSO Party

San Bruno, Calif., has entered a new phase in its c.d. planning with the election of a new civil defense director who is also City Manager. W6VYH is radio officer. A CD Radio Club has been formed and received the call letters K6PVJ. The San Bruno RACES plan was approved by FCC on July 18, 1957.

The RACES group of Norfolk, Va., held an emergency drill on March 27, observed by officers and guests of the surrounding navy, coast guard, air force and army installations. The operation went off very smoothly, with net control on 28.7 Mc. and frequent check-ins from the state control situation in Richmond. The few bugs that popped up will quickly be ironed out.

TRAFFIC TOPICS

The mail these days brings pleas from zealots of s.s.b., RTTY and high-speed c.w. to push the use of these particular methods in handling traffic. While true that each has something to be said for it one thing that is apparent in most cases is that most of these zealots are interested mainly in s.s.b., RTTY or tape c.w. and only incidentally in traffic handling; whereas, in this column, we are interested mainly in traffic handling and only incidentally in fostering new modes of communications. So, more often than not, we can't get together. They talk about filters, gadgets and results while we talk about routings, schedules and liaison. We just don't talk the same language. Perhaps what we need is some middle man who is interested in both traffic work in general and traffic by a specific mode or method in particular — an interpreter, you might say. Or perhaps more interest in traffic work and less in traffic gadgetry is called for.

We are of the old school of traffic men, the type who just doesn't go overboard for new methods unless they are tried and true and unless there is possibility of liaison with the older methods (e.g., c.w. and a.m. phone) that will continue to be used for quite some time. We don't like to see our traffic community divided into numerous special interest groups and thereby weakened. But what about some of these newer (not so new, really, but new to amateur radio) methods that are being proposed?

Well, let's take them one at a time. On numerous occasions we have been told that s.s.b. is a natural for phone traffic handling, that it's got the old a.m.-carrier stuff beat all hollow. By use of voice control, you can talk as naturally as you do on a landline telephone. We've listened, and this is true. It would make phone traffic handling easier, faster, and even more accurate. No reason why it shouldn't be used — by those amateurs who have s.s.b. equipment and are interested.

Same with RTTY. It's beautiful just to sit down and type out your traffic and know that it is being reproduced at the receiving end just as you type it — provided a lot of things. If you punch a tape for transmitting, a steady 60 w.p.m. can be maintained. But you can't use it unless you have the equipment, install it and get it working; and even then you usually have to fiddle around a while before you can get it to work properly.

Same with high speed c.w. A few amateurs have operators and sending heads. Nothing is more beautiful to a good c.w. man than to listen to perfect c.w., which means machine-sent c.w. Not so long ago we conducted an experiment with K6EWY in which he sent us his traffic at 70 w.p.m. while we recorded the signal on magnetic tape; we then played it back at half speed for perfect copy. The advantage? Only a reduction in on-the-air time. By using recorders that can reduce the speed by more than one half, the actual speed can be increased to as much as 150 w.p.m. slowed down to 37.5. Or, given siphon recorders and operators who can "read slip," speeds can be even higher. This may seem to be verging on commercial procedures, but actually these methods are for the most part obsolete in commercial circles, and that is one reason why used equipment to make them possible is gradually coming into the amateur market.

One very simple method that could be used in automatic relaying of traffic is "repeating" a c.w. signal by a higher-powered station or one better located than the station from which the signal originates. For example, traffic could be transmitted by a station on the west coast, automatically repeated by a station in the midwest for copy on the east coast. How? Simply by rectifying the output of a receiver to operate a keying relay. There are some problems involved, both technical and legal, which we will not go into here except to say that they all seem capable of solution.

We are not necessarily recommending universal adoption of these methods, but only mentioning them as something worth thinking about. Amateur traffic handling doesn't just stand still, is not a cut-and-dried invitation to boredom. It has interesting and challenging organizational and experimental aspects which tend to attract some amateurs who have not heretofore been interested in traffic work for its own sake. We don't think that they should be tossed out or ignored as idealistic dreamers who, by proposing adoption of new methods, are "ruining the game." On the contrary we feel that these new methods and the people who are proposing them and experimenting with them should be welcomed and listened to, and what we old shellbacks should think about is how their ideas can be used to make our conventional traffic routes more effective and efficient.

Net reports. North Texas Oklahoma Net reports 31 sessions, 1116 check-ins and a traffic total of 310. Transcontinental Phone Net reports a traffic total of 6175, comprising 2563 for the First Call Area, 2694 for the Second Call Area and 918 for the Fourth, Ninth and Zeroth Call areas. Early Bird Transcontinental Net reports 31 sessions and 1027 message handlings. The 7290 Net reports 44 sessions, 1448 check-ins and a traffic total of 587. Interstate SSB Net reports 369 message handlings with an average check-in of 58 stations and average time in session of one hour, 32 minutes.

National Traffic System. We have often said that the NTS has two principal objectives: the systematic handling of traffic and training of traffic men, not necessarily in that order of importance. A point that seems to need to be made clear in connection with the training objective is that because this is one of our aims it does not follow that all NTS nets should or must be beginners' nets, or that beginners should be welcomed into all NTS net levels. Such a concept is as ridiculous as welcoming grade school students into college classes, or college freshmen into graduate seminars. There are levels of training, and each must be achieved before one can go on to the next. This is axiomatic, logical, common horse sense.

Yet, we have seen tendencies among some of our high-level nets to make the beginner stay at home even to the extent of tearing down the net's efficiency. Let's face it, at regional, area and TCC level we aren't beginners in code or message-handling procedure. Those things are prerequisite to participation at that level, they are (or should be) second nature to us by then. As we proceed up the ladder, the traffic-dispatching procedure gets faster, more clipped, less informal. Our training then is not in sending code or the form of a message, but how to operate in an snappy, efficient nets, the use of QN signals and other net procedure signals, how to be brief in giving and receiving instructions; in other words, not so much in how to handle traffic as in how to handle traffic with efficiency and dispatch.

The place for the code beginner is in a section (or other) slow speed net. The place to learn the fundamentals of

message form, traffic handling and net procedure is in the section traffic net. When you get into the regional net, you're in traffic college, and area nets and TCC are for graduate students. Code speeds get higher, procedure is based on the assumption that the operator already has experience with the basic fundamentals and is entering on a new, advanced phase of this work. An operator without such experience is apt to have a rough time. It is customary, when a beginner stumbles into a regional or area net, to give him prompt QNX in order that the net's business can proceed without delay. Often such a beginner is resentful of such high-handed procedure, so the NCS should drop him a card explaining that this is an advanced net and that it has a great deal of traffic to handle in a limited time, that no offense was intended. Suggest that he participate in his section traffic net, and send him (or ask us to send him) a copy of CD-24 and a net directory.

We don't recommend any codespeed minimum or maximum on NTS nets, but we do think that each NTS net should remember its mission and set its operation accordingly, both as to code speed and procedures.

Net	Sessions	Traffic	Rate	Ave. sessions per night	Repres.
EAN.....	25	1355	.914	54.0	99.3
CAN.....	31	1728	.967	55.6	100
PAN.....	31	1304	.631	42.0	93.5
IRN.....	26	424	.342	16.3	91.71
2RN.....	50	462	.366	9.2	99.6
3RN.....	42	345	.330	8.2	91.3
4RN.....	52	475	.237	9.1	67.0
RN5.....	52	893	.490	17.1	87.2
8RN.....	50	168	.183	3.4	85.3
9RN.....	61	1139	.464	18.6	86.5
TEN.....	93	1385	.457	14.9	65.3
ECN.....	16	199	.404	12.4	95.81
Sections ²	921	8189	....	8.9	....
TCC (Central).....	60 ³	886	....	....	....
TCC (Pacific).....	98 ³	1078	....	....	....
Total/					
Summary	1450	20030	CAN	12.5	CAN
Record.....	1450	20030	....	13.9	100

¹ Regional net representation based on one session per night. Others are based on two or more sessions per night.

² Section nets reporting: SCN (S. C.); SCN (Cal.); Iow 75 Phone; BN & OSN (Ohio); S. Dak. 75 Phone & S. Dak. 40 Phone; CN & CPN (Conn.); GSPN (N. H.); GSN (Ga.); STS (S. Texas); TLCN (Iowa); NJN (N. J.); ILN (Ill.); WSN (Wash.); AENB, AENP & AENT (Ala.); FN (Fla.); MISPN, MJN & MSN (Minn.); QKN (Kans.); CWXN, CSSN, HNN & Colo. Emerg. Fone (Colo.); Tenn. C. W. QMN (Mich.); KNN KSN, KPN & KYN (Ky.).

³ TCC functions reported, not counted as net sessions.

Another record-breaking month on NTS, despite lack of two regional net reports and one TCC report. Even for the record overall average-per-session we had to go back as far as 1950, the first year we recorded these statistics.

Smitty, K6DYX, puts out a neat little statistical bulletin and gab sheet for PAN each month. QRM from OM Cupid is effecting W2ZRC's resignation as of Aug. 1; 2RN certificates have been issued to K2RRH, W2ZVW and K2EFA. Teen-agers are the backbone of 3RN, with an average age of 15; W3s AFF CMN DTK GYP HIZ LXU and WHK. W4SHJ has issued 4RN certificates to K4s GAT JKK and KNP; watch 4RN representation increase with new reps from C.Z. and W.I. Effective May 1, 9RN sessions will be at 1730 and 2000 CST; net certificates have been awarded to W3PCQ, K9GVD and K9GDQ. ECN is getting new life from the VE1 boys.

Transcontinental Corps. The following stations have been issued TCC certificates for the Pacific Area as of Mar. 31: W5DWB, W6s ADB BPT EOT HC PLG VZT, K6s DYX EWY GID GZ, W7GMC, W6s KQD WMK. Nice going, guys and gals. These certificates don't come easy.

March reports:

Area	Functions	% Successful	Traffic	Out-of Net Traffic
Central.....	60	95	1508	886
Pacific.....	98	93.9	2152	1078
Total.....	158	94.3	3660	1964

The TCC roster: Pacific Area (W6BPT) — W5s DWB IGO, W6s ADB BPT PLG EOT VZT HC, K6s DYX EWY HLR GES ORT GID, W7GMC, W6s KQD WMK.

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for February traffic:

Call	Orig.	Recd.	Rel.	Del.	Total
W2KEB	285	1616	1188	370	3459
W2HDR	33	927	813	11	1783
W7BA	26	838	820	17	1701
W8SCA	20	787	784	15	1606
W9LJX	74	630	631	23	1382
W9DQ	574	561	561	1776	1776
W11EQ	967	121	82	36	1226
W9P1	13	569	542	57	1211
K9MCA	143	562	466	10	1181
W9XY	3	577	550	27	1157
W9ZDZ	11	572	509	45	1137
W4P	10	500	539	9	1111
W8LPH	15	532	479	47	1073
K6HLR	111	485	316	151	1063
W3WIQ	39	471	404	106	1020
W3CUL	137	497	311	69	1014
W9NZZ	285	342	1	338	966
W3BZ	12	482	457	14	965
W3LQG	45	409	428	21	936
K9HCQ	2	485	0	451	938
K4ONQ	42	419	120	301	882
W7APF	19	413	411	1	844
W9TOL	86	406	319	5	816
W6GYH	131	322	303	11	767
W1BXT	52	369	317	3	741
K9PZ	10	329	273	47	708
W6YDK	118	285	119	165	687
W9OHJ	13	337	331	5	686
K6MLL	18	325	331	8	685
W9JQZ	15	350	309	7	681
K4OAH	18	319	310	2	649
W9RQD	74	292	270	4	640
K9PZ	81	307	212	28	623
W9ZWL	4	323	22	269	619
W6GOY	261	92	159	97	609
W4IWM	7	300	259	41	607
W8WGU	138	232	118	110	598
W7PGY	32	281	237	44	594
W1A	25	281	277	3	586
W3UJL	16	263	256	18	584
K6CLS	127	249	189	17	582
K4DSN	11	279	273	6	569
W1YBH	91	257	110	89	547
K4AET	3	273	262	7	545
K6GK	17	264	96	165	545
K9GKD	0	260	193	86	541
K9OZI	11	250	240	18	529
K1BCS	330	101	84	13	528
W0GAR	10	254	258	6	528
W9GQX	70	251	191	15	527
K4KIN	8	267	249	2	526
W2VDT	30	242	173	80	525
VE3AM	34	240	207	33	514
K4PXA	19	271	169	31	510
W9PZ	12	248	231	17	508

Late Reports:

K1BCS (Feb.)	124	429	407	10	970
K6GK (Feb.)	41	337	125	212	715
W9BLI (Feb.)	4	256	247	3	510
W5ACK (Feb.)	10	248	238	10	506

More-Than-One-Operator Stations

Call	Orig.	Recd.	Rel.	Del.	Total
K4CSH	32	578	570	8	1188
KA1AIS/4	564	145	58	11	768
W4DFU	687	15	10	5	717

BPL for 100 or more originations-plus-deliveries

K9JHA	394	K4EZL	124	W58MK	108
K4KJC	245	K5BNH	122	K9ELT	108
K9GDF	219	K5LZW	118	W9ETM	106
W9GQX	142	K4LZD	117	W9ETM	105
K6CZ	179	W3TN	113	W9PCQ	103
W6ZJB	161	W5EGD	112	W9WBE	100
K4QEF	150	W9QOT	112		
W9GFE	139	K2WAO	111		
W3CUL/4	137	K4JOP	111	K5LZW (Feb.)	151
W9UOL	136	K9GCN	111	K4GWO (Feb.)	128
W1YRZ/2	132	K9NMMZ	109	W1EOW	105

More-Than-One-Operator Stations

K9IDT	328	K3WBQ	201	W9YTF	100
W9QQQ	240	K7WTW	125		

BPL medallions (see Aug. 1954 *QST*, p. 64) have been awarded to the following amateurs since last month's listing: K2FCB, K4LVE, K6EWY, W7FKK, W8DJN, W8WGU.

The BPL is open to all amateurs in the United States, Canada, Cuba, and U. S. possessions who report to their Section a total of 500 or more min. of 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt, in standard ARRL form.

ELECTION NOTICE

(To all ARRL members residing in the Sections listed below.)

You are hereby notified that an election for Section Communications Manager is about to be held in your respective Section. The notice supersedes previous notices.

Nominating petitions are solicited. The signatures of five

or more ARRL full members of the Section concerned, in good standing, are required on each petition. No member shall sign more than one petition.

Each candidate for Section Communications Manager must have been a licensed amateur for at least two years and similarly a full member of the League for at least one continuous year immediately prior to his nomination.

Petitions must be in West Hartford, Conn., on or before noon on the closing dates specified. In cases where no valid nominating petitions were received in response to previous notices, the closing dates are set ahead to the dates given herewith. The complete name, address, and station call of the candidate should be included with the petition. It is advisable that eight or ten full-member signatures be obtained, since on checking names against Headquarters files, with no time to return invalid petitions for additions, a petition may be found invalid by reason of expiring memberships, individual signers uncertain or ignorant of their membership status, etc.

The following nomination form is suggested. (Signers will please add city and street addresses to facilitate checking membership.)

Communications Manager, ARRL. [place and date]
38 La Salle Road, West Hartford, Conn.

We, the undersigned full members of the ARRL Section of the Division, hereby nominate as candidate the Section Communications Manager for this Section for the next two-year term of office.

Elections will take place immediately after the closing dates specified for receipt of nominating petitions. The ballots mailed from Headquarters to full members will list in alphabetical sequence the names of all eligible candidates.

You are urged to take the initiative and file nominating petitions immediately. This is your opportunity to put the man of your choice in office.

—F. E. Handy, Communications Manager

Section	Closing Date	SCM	Present Term Ends
Yukon *	June 10, 1958	W. R. Williamson	Mar. 17, 1949
Louisiana	June 10, 1958	Thomas J. Morgavi	May 31, 1958
West Indies	June 10, 1958	William Werner	Aug. 10, 1958
Western New York	June 10, 1958	Charles T. Hansen	Aug. 10, 1958
Kentucky	June 10, 1958	Albert M. Barnes	Aug. 16, 1958
Montana	June 10, 1958	Vernon L. Phillips	Sept. 1, 1958
Western	June 10, 1958	John F. Resigned	
Pennsylvania		Wojtkiewicz	
North Dakota	June 10, 1958	Rev. Casper F. Bonifas	
Northern New Jersey	July 10, 1958	Lloyd H. Manamon	Sept. 25, 1958
Wyoming	July 10, 1958	James A. Masterson	Resigned
Central Zone	July 10, 1958	P. A. White	Oct. 1, 1958
Idaho	Aug. 11, 1958	Rev. Francis A. Peterson	
Vermont	Aug. 11, 1958	Mrs. Ann L. Chandler	Oct. 10, 1958
Nevada	Aug. 11, 1958	Albert R. Chin	Oct. 10, 1958
Santa Clara Valley	Aug. 11, 1958	G. Donald Eberlein	Oct. 15, 1958
Rhode Island	Aug. 11, 1958	Mrs. June R. Burkett	Oct. 15, 1958
Arkansas	Aug. 11, 1958	Ulmon M. Goings	Oct. 15, 1958
New Hampshire	Aug. 11, 1958	John Arthur Knapp	Oct. 26, 1958
Kansas	Aug. 11, 1958	Earl N. Johnston	Oct. 29, 1958

* In Canadian Sections nominating petitions for Section Manager must be addressed to Canadian Director Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before closing dates named.

ELECTION RESULTS

Valid petitions nominating a single candidate as Section Manager were filed by members in the following Sections, completing their election in accordance with regular League policy, each term of office starting on the date given.

Alberta Gordon W. Hollingshead, VE6VM May 1, 1958

Ontario Richard W. Roberts, VE3NG June 15, 1958

In the South Carolina Section of the Roanoke Division, Dr. J. O.

Dunlap, W4GQV, and Mr. Bryson L. McGraw, W4HMG, were nominated. Dr. Dunlap received 187 votes and Mr. McGraw received 81 votes. Dr. Dunlap's term of office began March 4, 1958.

In the Ohio Section of the Great Lakes Division, Mr. Wilson E. Weekel, W8AL, and Mr. Charles C. Miller, W8JSU, were nominated. Mr. Weekel received 785 votes and Mr. Miller received 424 votes. Mr. Weekel's term of office began March 5, 1958.

In the North Carolina Section of the Roanoke Division, Mr. B. Riley Fowler, W4RRH, and Mr. Alfred Beacham Leonard, W4RXG, were nominated. Mr. Fowler received 285 votes and Mr. Leonard received 172 votes. Mr. Fowler's term of office began March 6, 1958.

In the Tennessee Section of the Delta Division, Mr. R. W. Ingram, W4UIO, and Mr. Harry C. Simpson, W4SCR, were nominated. Mr. Ingram received 241 votes and Mr. Simpson received 216 votes. Mr. Ingram's term of office began April 15, 1958.

In the Washington Section of the Northwestern Division, Mr. Robert B. Thurston, W7PGY, and Mr. Howard S. Pyle, W7OE, were nominated. Mr. Thurston received 343 votes and Mr. Pyle received 292 votes. Mr. Thurston's term of office began April 30, 1958.

A.R.R.L. AFFILIATED CLUB HONOR ROLL

This month we're proud to present the first '58 Honor Roll of those affiliated clubs whose *entire membership* consists of members of the League. Affiliates having 100 per cent ARRL membership are determined by consulting information incorporated in the club's official Annual Reports. An additional *QST* Honor Roll will be published later this year. Clubs reporting the results of ARRL membership drives being conducted currently can then be included. Each club listed below will now receive a special recognition a 100% ARRL Club certificate. Appropriate for display in the club rooms, this certification makes a permanent record of the high standing and membership record of the society.

Aeronautical Center Amateur Radio Club, Inc., Oklahoma City, Okla.

Amateur Radio Club of Central Missouri, Inc., Sedalia, Mo.

Beacon Radio Amateurs, Philadelphia, Pa.
Birmingham Amateur Radio Club, Inc., Birmingham, Ala.
Central Kansas Radio Club, Inc., Salina, Kans.
Crawford County Amateur Radio Association, Meadville, Pa.

The DX Club, Lansdale, Pa.
Enid Amateur Radio Club, Inc., Enid, Okla.
The Fifty Club of California, Los Angeles, Calif.
Gratiot County Amateur Radio Club, Alma, Mich.
Jacksonville Amateur Radio Society, Jacksonville, Fla.
Kerrville Radio Club, Kerrville, Tex.
Keystone Amateur Radio Club, Springfield, Pa.
Marathon Amateur Radio Club, Marathon, N. Y.
Maui Amateur Radio Club, Kahului, Maui, T. H.
Norfolk County Radio Association, Norwood, Mass.
Northwest St. Louis Amateur Radio Club, Inc., Florissant, Mo.

Orange Amateur Radio Club, Inc., Orange, Tex.
Order of Boiled Owls, Levittown, N. Y.

Pacific Radio Club, Los Angeles, Calif.
Pickens County Amateur Radio Assn., Inc., Easley, S. C.
Rappahannock Valley Radio Club, Fredericksburg, Va.

The Reading Radio Club, Inc., Reading, Pa.
St. Louis Amateur Radio Club, Inc., St. Louis, Mo.
Sheridan Radio Amateur League, Sheridan, Wyo.

South Bay Amateur Radio Society, Chula Vista, Calif.
South Lyme Beer, Chowder and Propagation Society, South Lyme, Conn.

Southwest Missouri Amateur Radio Club, Inc., Springfield, Mo.

State Line Radio Club of New York and New Jersey, Upper Saddle River, N. J.

Tehama County Radio Club, Red Bluff, Calif.
The Totah Amateur Radio Club, Farmington, N. M.
Windblowers' V.H.F. Society, Saddle Brook, N. J.

CLUB COUNCILS AND FEDERATIONS

Affiliated Council of Amateur Radio Clubs, Ron Mayer, W7NGW, Secy., P.O. Box 1335, Portland 7, Ore.

The Cleveland Area Council of Amateur Radio Clubs, Richard E. Francis, W8SZF, Secy., 1323 Plainfield Rd., Cleveland 21, Ohio.

Federation of Eastern Massachusetts Amateur Radio Associations, Eugene H. Hastings, W1VRK, Secy., 28 Forest Ave., Swampscott, Mass.

Indiana Radio Club Council, Inc., Fred Sawyer, W9FJI, Secy., 526 South Gibson St., Princeton, Ind.

Los Angeles Area Council of Amateur Radio Clubs, Inc., Samuel J. Walker, K6IRY, Secy., 9665 La Alba Drive, Whittier, Calif.

Michigan Council of Clubs, Roland R. Beineman, W8QBA, Secy., 136 Guild St., N.E., Grand Rapids 5, Mich.

Ontario Amateur Radio Federation, Inc., William Choat, VE3CO, Secy., c/o Canadian Westinghouse Co., Ltd., 195 Front St., Toronto, Ont., Canada.

San Diego Council of Amateur Radio Organizations, Nick J. Callas, K6DBJ, Secy., 4518 Kamloop Ave., San Diego 17, Calif.

FEBRUARY FREQUENCY MEASURING TEST RESULTS

The FMT of February 14, open to ARRL Official Observers and other amateurs alike, brought entries from 238 participants who made a total of 939 measurements; 127 entries came from OO's and 111 from non-Observers. Everyone taking part has already received an individual report comparing the accuracy of his measurements of the special W1AW transmissions with those of a professional frequency-measuring laboratory.

The standings of the leaders are given below. Decimal fractions are shown only to establish an order of listing, because the official readings can be accredited only to 0.4 parts per millions. Sharing top honors equally, therefore, are W1VW, W8CUJ, W4JUI, W2AIQ, W8HB, W8LIF and W5NKH.

Observers	Parts/ Million	Non- Observers	Parts/ Million
W1VW	0.1	W8HB	0.1
W8CUJ	0.1	W8LIF	0.2
W4JUI	0.2	W5NKH	0.3
W2AIQ	0.3	W6WKO	0.6
W1MUN	0.5	W8GQ	0.7
W2FE	0.6	K2BZD	1.0
W9TZN	1.0	W6AXV	1.0
W4CVO	1.3	W1WPG	1.3
W8GBF	1.7	W8DD	1.5
W66HM	2.3	W1LER	2.8
W2GOK	3.2	W8KFS	4.1
W6GQA	3.5	K6HI	4.2
W1RLQ	4.0	W8TZD	4.3
W8LWE	4.2	W3QVT	5.1
W9PBI	4.4	W9OUT	5.4

The following ratings are based on a single measurement: OO — W7PQJ 0.1. Non-OO — K6RTD 0.1.

CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made on June 23 at 2130 Eastern Daylight Saving Time. Identical texts will be sent simultaneously by automatic transmitters on 1820, 3555, 7080, 14,100, 21,010, 28,060, 50,900 and 145,600 kc. The next qualifying run from W60WP only will be transmitted on June 4 at 2100 PDST on 3590 and 7128 kc.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 16 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from W1AW each evening at 2130 EDST. Approximately 10 minutes' practice is given at each speed. Reference to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of *QST* text sometimes is reversed. To improve your fist, hook up your own key and audio oscillator and attempt to send in step with W1AW.

Date Subject of Practice Text from April *QST*

June 3: *Checking Transistors*, p. 20

June 6: *A Half-Size Ground-Plane* p. 28

June 9: *A 50-Mc. Station for the Beginner*, p. 30

June 12: *Optimum Stacking Spacings* p. 40

June 17: *Minitrack Station . . .*, p. 48

June 30: *NSB*, p. 50

June 25: *Simulated Emergency Test—1957*, p. 52

June 26: *11th V.H.F. Sweepstakes Results*, p. 65

DXCC NOTES

In view of the recent Federation of British Territories in the Caribbean, and the desire to update the Countries List and bring it into line with the published criteria, the following changes to the ARRL Countries List are herewith announced. These changes will be effective as of June 1, 1958.

VP2. Anguilla
VP2. Antigua, Barbuda
VP2. British Virgin Islands
VP2. Dominica
VP2. Grenada & Dependencies
VP2. Montserrat
VP2. St. Kitts, Nevis
VP2. St. Lucia
VP2. St. Vincent & Dependencies
VP5. Jamaica (including Caymans)

All contacts with stations in the Caribbean prior to

June 1, 1958 will be credited on the basis of the ARRL Countries List in effect prior to June 1, 1958.

Contacts made with stations in what was previously listed as Leewards and Windwards will be credited on the following basis. If credit has already been given for a station in the Leewards, further credit cannot be given for that particular island. For example, if Leewards credit was obtained with VP2MY in Montserrat, no further credit can be claimed for Montserrat. A credit given for VP2LU on St. Lucia toward Windwards will count as St. Lucia and no further credit can be claimed for St. Lucia. On the other hand, a contact with VP2KM made on June 1, 1958, or after, can be claimed as credit for St. Kitts or a contact with VP2GC made on June 1, 1958, or after, can be claimed as credit for Grenada.

Contacts made with Caymans prior to June 1, 1958 will continue to be credited as separate from Jamaica. Contacts made with Caymans June 1, 1958 and later will count the same as Jamaica.

DO NOT submit confirmations for these changes before August 1, 1958. Confirmations received for credit with respect to these changes before August 1, 1958 will be returned without credit.

DX CENTURY CLUB AWARDS

HONOR ROLL

W6AM 278 W3BRA 272 W6DZZ 269
W9HGW 277 W3CJ 271 W5ASG 269
W3HGB 276 W3NBD 275 G2P1A 269
W9NDA 275 W6SYG 271 W6RW 269
KV4AA 275 W6MX 270 W2HUQ 268
W3GHD 273 W6JNN 270 W6CUQ 268
PY2CK 273 ZL2GX 270 W9RBI 268
W2AGW 272 W8JIN 264

W9QGI 201 W7GHB 170 K5ADQ 132
K2OEA 200 W9FNN 170 W9QNO 132
W5DML 200 ZS60V 170 W22Y 131
W6ATO 200 G2BXP 165 W6AFI 131
K6EYR 200 CN8JX 161 ZE5KKG 131
W2P7M 195 W1FFO 160 W2EJKU 131
W5GNG 160 W1TTS 160 ZE5KJL 130
W2RDD 160 W8AFX 160 W2EJK 130
W3EOK 158 W3EOK 130
W7NRB 130

W2AEB 191 K4EHA 155 W8FPR 130
W6GMC 191 K4EHA 155 W8FPR 130
W6QV 191 CR7AF 153 K9ACB 130
W1B1M 190 K4EHA 155 ZE5KJL 130
W1ICP 190 W6FUF 151 ZS6AJQ 129
W6SIA 190 W9UX 151 W2GND 128
W8AJW 190 W4YK 150 W8AYS 126
W9TQL 189 W2HTI 146 W9PQA 126
W5T1Z 186 W2PXR 145 VEGF 125
W608L 183 W3EOK 145 W4BFR 123
W6DW 183 E2DWM 145 W4BFR 123
W3HIN 182 G3GFG 145 W2BMR 120
W7HKT 182 W6QRA 141 K2EDH 120
W7AUS 181 GM5RH 141 K5RGB 120
W1E0B 180 K2LWR 140 W9IRH 120
D43RK 180 K6KJR 140 CNNDJ 120
W63KZ 178 K4EHA 140 F2P 120
W6WTH 176 W6WTH 140 OHIPZ 120
W4LFE 174 W9FVU 140 OKIAEH 118
W3LEZ 171 DL3TJ 140 WIAF 114
W5TPC 171 PA6VO 140 W3HDZ 113
W9UZS 171 W8WT 138 K2DGT 110
W6CZC 172 W6WTH 138 W2HAZ 110
W9MPX 170 W6LTX 138 W8WAN 110
W6ZTD 170 W6ZTD 133 W90AN 110
W6MUF 170 W8JFI 133 W9YKJ 110
W0VVK 133

From March 1, to April 1, 1958 DXCC certificates and endorsements based on postwar contacts with 100 or more countries have been issued by the ARRL Communications Department to the amateurs listed below.

W6V8S 232 F9EFP 106 K4CFB 101
W9HFB 188 G3HLY 105 K4JVE 101
VE7JB 173 OH3PB 105 W6QWV 101
VE7JB 163 W7LIO 104 W1LVQ 100
OZ5KQ 138 W9MLY 104 W3VQZ 100
OH3RS 135 G2RZ 104 W6RJW 100
OH6RC 134 W6LHZ 104 K4LNM 100
W1LZN 127 SM2ALU 104 K5CAO 100
W1UWB 121 W8SNL 103 W6KXG 100
KH6RR 114 DL3ZF 103 K6OPI 100
W9MUI 113 OK1LM 103 K9DRL 100
W4BBR 111 OK1VA 103 W9IWX 100
W5AUJ 110 W5KBT 102 W9INQ 100
W9WNB 110 W8SPW 102 W9INQ 100
W6MUE 109 W5M4EE 102 DL1YV 100
W5M5E 108 W1GFW 101 F3II 100
W3TBP 107 W1JTD 100 HA5AM 100
G2KU 107 W2BYN 101 OH3SO 100
W7FLD 106 W2LYO 101 ZS6DG 100

W8SKM 240 G2BXP 163 W2RTX 132
W5VU 216 W5VU 160 W0FUF 132
W9US 207 IICTF 159 W3EOK 130
IIAMT 206 W9HP 157 KG6AGO 123
W5PAP 206 W8PUD 156 HB9KEL 122
W5ASG 196 D13EA 145 W6TEL 121
PY1AQT 192 HK4DF 144 W1UWB 120
W4E5P 192 W5ERY 143 W1VAN 120
W5JW 182 WIGKK 142 W4GRP 120
W5ADY 180 W5JW 141 DL1WP 120
F9E8L 180 W6WGL 140 VE1NH 119
W9AJW 177 W77J 139 W1VAN 115
W5T1Z 172 G3DPJ 134 K4EHA 114
W1FFO 171 DL3TJ 134 W3MDE 111
W2JY 170 W8WT 133 W4VCB/3 110
W2ZX 170 WILLF 132 W4YQ 110
W3HIX 170

Radiotelephone

W2PTE 201 ZS6NZ 114 W2GNQ 102
W2CAK 175 W7GBY 113 W3A2B 102
W6BFB 153 K4LNM 102 W6WJL 102
W6WJL 149 W1AUF 108 W9B1J 102
W6V8S 133 W9PQA 108 CN2A2K 102
W2R2K 121 W9MKJ 107 F9SH 102
YV5ABD 121 PY4APF 107 OZ2JF 102
W5HGX 120 ZL2ANZ 106 W4KZF 101
JA6HK 118 WNGNY 105 W1KTV 100
W3JZY 117 W9WQZ 105 W2P7V 100
W7VME 114 DA4YL 105 W4UWC 100
CX1AK 114 W8AWK 104 W6EHN 100
DL7AA 114 W8NGA 103 W8TOZ 100
OH3PB 103

W7JAM 255 VE3QD 210 VETGJ 236
W7TAM 255 VE4XO 210 VESAW 235
W9AIW 255 VE5CZ 210 ZS6BW 262
VE1PQ 189 VE5RU 210 VE5RU 241
VE2WW 210 VE6NX 200 VO6EP 190

ENDORSEMENTS

W9YFV 267 DL7AA 240 W6CAE 214
W1ME 264 W50LG 230 W9VBQ 213
W6T1 260 W7ENW 230 W9YXS 212
CN8MM 260 W4CYY 224 W3A1M 211
VK2ACX 254 W5FXN 223 K4A1M 210
W1QWV 253 W2LVD 223 W5OG8 210
W6GPB 251 ZS6FN 222 W2IWC 202
W3EPV 250 W8NGO 221 SM3AKM 202
W6UHA 250 W2T2X 220 W2TWC 201
W1AXA 240 W9UXO 220 W4DHZ 201

W2BXA 215 VE1CR 120 VE6NX 112
W4HAA 212 VE2WW 138 VE7ZM 197
W5BGP 228 VE3AU 120 G2PL 242
W7HIA 221 VE3RU 143 4X4DK 232
W9AIW 233 VE5RU 143 ZL1HY 240

W/VE/VO Call Area and Continental Leaders

W7JAM 255 VE3QD 210 VETGJ 236
W7TAM 255 VE4XO 210 VESAW 235
W9AIW 255 VE5CZ 210 ZS6BW 262
VE1PQ 189 VE5RU 210 VE5RU 241
VE2WW 210 VE6NX 200 VO6EP 190

Radiotelephone

W2BXA 215 VE1CR 120 VE6NX 112
W4HAA 212 VE2WW 138 VE7ZM 197
W5BGP 228 VE3AU 120 G2PL 242
W7HIA 221 VE3RU 143 4X4DK 232
W9AIW 233 VE5RU 143 ZL1HY 240

SCM AREC ORS CP SEC OBS TCC OO
 SCM WAS Station Activities SCM
 OES A1OPR EC DXCC CLUBS RM OPS RCC

All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—Richard B. Mesirov, W3JNQ—SEC: DVB, RM: PDJ, PAM: TEJ. The PFN meets on 3850 kc. at 1800 Mon. through Fri. The E. Pa. C.W. Net meets on 3610 kc. at 1830 Mon. through Fri. New appointments: PDJ as RM, (YAZ retired because of impending school-teaching and/or Army). Appointments: WKX, DJW and CMN as OBS, EPL as Columbia County EC, BUR as Bucks County EC. I am sure the rest of the gang join the SCM in wishing YAZ the best after his FB stint as RM. BES reported that when he attempted to lower his 80-meter wire recently, the weight was so great that it lifted him off the ground. New officers of the Lancaster RRTS are JYL, pres.; KFI, vice-pres.; OY, secy.; HXY, treas.; RLT and K3BCG, directors; KAQ, publicity. CMN received his WAS certificate. WHK has a new S85. ZXV has a new four-element 20-meter beam. IMN received W-Del. certificate No. 100. NF reports that the Delaware-Lehigh ARC had a good meeting, complete with an FCC inspector. GYP is on 7 Mc. only because of receiver troubles, but has worked some new DX anyway. CUL played it smart and left for sunny Florida during the snow. New officers of the Abington ARC (Clarks Summit) are CWW, pres.; QDW, vice-pres.; HNK, secy.-treas., BNRs operating time is cut down by night work. KN3ASH and KN3BKT took the General Class exam on the same day and passed. KN3DJU gets on the air with a bang, using an NC-300 and a Ranger. FCI broke away from traffic, working DX for the first time. KIANS reports that his station is now completely relay operated. New officers of the West Branch ARA are KDK, pres.; RGB, vice-pres.; KNG, secy.; NEY, treas.; HCW, corr. secy. The club, with 32 active members, has completed its club house, has a new HQ-110 and uses the call AVK. ZRQ reports the forming of the Anthracite Wireless Assn. for General Class licensees over 21. To those who missed the first Pa. QSO Party on April 5/6—too bad. While the E. Pa. turnout was very small, more than 200 logs have been turned in as of this writing. The Harrisburg Radio Amateurs Club issues a "Keystone Award for proof of contact with 100 different Pennsylvania amateurs after Jan. 1, 1957. The 100 confirmations and a list should be sent to Awards Manager BQA, Dillsburg, Penna. There is a charge of \$1 to FCC-licensed amateurs, one IRC to others and postage must be included for return of cards. Write RPG or BQA for details. Traffic: W3CUL 1014, TEJ 237, HNK 124, WHK 121, CMN 54, BFF 50, FCI 50, EPL 49, BUR 36, LHA 27, PDJ 22, AMC 15, NQB 15, NF 14, ZRQ 14, FKE 12, WQL 12, ZVX 9, ADE 4, GYP 4, UIU 3, BNR 1, IMN 1, KFI 1.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Louis T. Cronberger, W3UCR—Asst. SCM for Delaware: Ray de Concille, 3DQZ, SEC: CXG, Section net: MDD 3650 M-S 1915 EST; MEPN 3820 MWF 1830, SS 1300 EDST; Del. Emerg. Net 3905 Sat., 1830 EDST. New appointments: CXG as SEC, MCG as RM, OMN, who also is CDRD RACES, as Montgomery Co. EC. Your SCM had the pleasure of being a guest speaker at the AAARC on Mar. 6, and spoke on "Getting Publicity for Your Club." UCR was guest speaker at the Kent Co. ARC on Mar. 11 and spoke on "TVI and TVI Committees." DQZ also was present and both enjoyed meeting with the Kent Co. hams. On Mar. 25 the Frederick Co. amateurs met and adopted their constitution and by-laws and the Frederick Amateur Radio Transmitting Society was born. Officers are WFT, pres.; FRV, vice-pres.; BZT, secy.:

ARA, treas.; DCV, trustee. The WRC had 4NJF at its Mar. 7 meeting and Gay spoke on "Indoor Antennas." The NCVHFS elected KMV, pres.; 4ZBS, vice-pres.; GCO, rec. secy.; and reelected K4SYF (ex-3DWU) secy.-treas. The WMRC's new officers are 4ZLN, pres.; 4WVF, vice-pres.; IHBH, rec. secy.; IN corr. secy.-treas.; K3BDZ (ex-4LCX) the mgr. The Foundation of Radio Amateur Clubs reelected ECP, pres.; NL, 2nd vice-pres.; 4ZM, secy.; RE, treas. and elected YYB, 1st vice-pres. The RCARAS' officers are MKS, pres.; CCR, sr. vice-pres.; PZZ, jr. vice-pres.; YAG, secy.; FWP, treas. The Antietam RA's new club bulletin is QRV. PZV is on Johnson Is. for 2 years and is /KB6 until a call is assigned. Dick is working 20-15- and 10-meter c.w. He schedules WV (his dad) and 5RVI (his brother in Texas). YAE has moved to D. C. and hopes to get on the h.f. bands. IFA is president of the Taft School radio club. ZNK is teaching a class of 14 who are working for their Novice Class licenses at the U.S. Naval Reserve Training Center, Cumberland. Congratulations on a job well done through AREC, RACES, clubs and individual amateurs in the March Snow Emergency. TN has qualified for a BPL medallion with his third BPL UE made BPL for the 2nd month running. K3BCG has a new three-element beam on 15 meters. BCB and 4EKO/3 are taking 2 meters seriously and have built a 5-over-5 besides a 5-over-3 at Fred's home. Paul is now mobile with a Communicator and is building antennas for the Havre de Grace address. EQK has received the 130 stamp for DXCC. K3ANE now is General Class and is working phone and DX. CDQ was active in the YL/OM Contest. WLO was elected director of the Del. Emerg. Net; the other directors are K1 and JDP. Ex-4MG, formerly of Arlington, Va., now is at Laurel, Md. SLG/13 now is stationed at the Aberdeen Proving Ground. From all reports the Delaware QSO Party was a huge success. The following have received their calls as a result of the KCARC classes: KN3DIL, DIP, DIQ and DIR. It has been noted that DIQ, DIQ and DIR are all at the same QTH, when an NC-300 and a Globe Chief is employed. KN3CRC is on the 7-Mc. Novice band midnight to 6 A.M. Sat. and Sun. is glad to QSO any who need Delaware. On July 13 at the MEPN Picnic, Braddock Heights Park, and Aug. 15-17, at the ARRL National Convention in Washington, CU Field Day on 75 meters from RCN 1. Traffic: (Mar.) W3UE 584, K3WBQ 288, W3WG 257, NNM 147, TN 132, HIZ 94, PQ 93, AHQ 70, EKO 67, COK 50, BUD 37, UCR 19, EQK 14, WSE 8, BKE 1, BWT 6, OYX 6, AKB 4, FNM 4, CN 3, HKS 2, WTE 2. (Feb.) W3WV 134, COK 51.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K3BG—SEC: YRW, PAM: ZL. Appointments: HDW as RM; K2HHJ as OPS and K2SOW as ORS. RG has QSYed to 21 Mc. with his transistor rig with an input of 148 MW. K2CPR has reached the 239 mark in countries worked. FYS is attending Bucknell U. Look for NJN on 3695 kc. every night. The SJRA again topped all others in the recent V.H.F. Contest. K2HOD is contest chairman. Burlington County C.D. Headquarters is now licensed as K2QGE. ZBZ reports increased efficiency at State Hq. with new equipment and more operators. The NJN held 26 sessions this month and handled 283 messages. The Burlington Short Wave Radio Club elected K2PPT, pres.; K2SQS, vice-pres.; K2QJ, secy.-treas. DVRA officers recently elected are K2AAR, pres.; K2LZA, vice-pres.; BZJ, secy.; JWA, treas. HAZ lost all his antennas in a recent storm. K2MBD, Camden Co. EC, does a fine job in RACES-AREC planning. K2PTJ is issuing many new "Worked 50 SJRA" certificates. The Delaware Twp. High School news and needs are reported by K2ZID. TE has 205 on his DX list. Look for BV on 2 meters every Monday night for Cumberland Co. news. SVV is recovering from a recent operation. Mercer Co. emergency communication, under the direction of HX, did FB in the recent storm. K2JW supplies the Mercer County news. Register with RACES/AREC and forward monthly activities reports to your SCM. Traffic: W2HDW 318, RG 228, W1YRZ/2 151, K2WAO 113, JGU 91, SOW 74, PPT 71, W2ZI 59, BZJ 41, K2QOS 12, CPT 6, SOX 2.

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: PPY, PAM: LXE, NAI and TEP. (Continued on page 114)

RESEARCH AND AMATEUR RADIO

MANY of our amateur radio friends don't realize the wide research and development activities that the Hallicrafters Company has been engaged in for a good number of years. We are not in a position to disclose many of these developments because they have to do with government projects. However, let's consider some of the interesting ones which we can discuss.

OBVIOUSLY, a majority are somewhat removed from immediate application in amateur communications, but their corollary uses soon may be seen. For example, the disposal of heat in electronic gear is always a problem. We currently are manufacturing special liquid cooled heat exchangers which are highly efficient and lightweight. If you would like, those kilowatts that now heat up your shack can be dissipated quite easily by mechanical means.

THERE is interesting to note that Hallicrafters has a specialized antenna design group, equipped with the latest laboratory gear, that devotes all its time to the design and testing of new types of antennas. It is quite conceivable that some day a number of their developments may be instrumental in obtaining better radio transmission, and reception.

ONE of the most intriguing laboratories at Hallicrafters is the complete and separate environmental section where testing of components over long periods of time, at maximum extremes of high acceleration, vibration, temperature changes and humidity is carried out. The information learned here, daily, assures better equipment tomorrow.

ANOTHER fact we think you'll find interesting concerns a series of "black boxes" Hallicrafters is producing. The "outputs" of these boxes can be fed into radar systems to simulate unlimited target or interference conditions. These "simulators" are being widely used today for training radar personnel as well as for testing new and extremely complex electronic devices.

ACCURATE clock time, independent of vertical speed position or altitude, is mandatory under many specialized conditions. Hallicrafters has these clocks in operation, fully transistorized.

AS PREVIOUSLY stated, the direct benefits of these new products to the amateur field may not be apparent at first glance. However, consider the wide experience in engineering and production that our engineers gain in evolving these complex items. The results can be seen best in the transistor techniques of the first fully transistorized, all ham band receiver, with associated S.S.B. transmitter, which Hallicrafters has just recently demonstrated. Only two tubes are in the whole unit. And we can assure you better things are on the horizon.

Peter A. Ricke, KHHY, of Cincinnati, Ohio was the winner of the Hallicrafters Single Sideband Contest. We are using this opportunity to tell all hams, since a number of recent letters indicates some hams never received this information.

73,
FRITZ FRANKE

Beebe, Jr. W. J. Hallyan W9AC for hallicrafters



All of these licensed radio amateurs make important contributions to the Heath line of fine ham kits. In a sense, they are your personal representatives within the company, because their design ideas and performance preferences reflect not only their own "on-the-air" experiences, but those of the amateur fraternity with which they are in constant contact. With this kind of representation in Benton Harbor, you can continue to rely on high-performance Heathkit amateur radio equipment designed by hams, for hams!

HEATH hams work to bring you



ROGER MACE (W8MWZ)
SENIOR HAM ENGINEER
HEATH COMPANY

HEATHKIT 50-WATT CW TRANSMITTER KIT

MODEL DX-20

\$35.50



If high efficiency at low cost in a CW transmitter interests you, you should be using a DX-20! It employs a single 6DO6A tube in the final Amplifier stage for plate power input of 50 watts. The oscillator stage is a 6CL6, and the rectifier is a 5U4GB. Single-knob band-switching is featured to cover 80, 40, 20, 15, 11 and 10 meters, and a pi network output circuit matches antenna impedances between 50 and 1000 ohms to reduce harmonic output. Designed for the novice as well as the advanced class CW operator. The transmitter is actually fun to build, even for a beginner, with complete step-by-step instructions and pictorial diagrams. All the parts are top-quality and well rated for their application. "Potted" transformers, copper-plated chassis, and ceramic switch insulation are typical. Mechanical and electrical construction is such that TVI problems are minimized. If you desire a good clean CW signal, this is the transmitter for you! Shpg. Wt. 19 lbs.

HEATHKIT "APACHE" HAM TRANSMITTER KIT

- Newly Designed VFO—Provision For S.S.B. Adapter
- Modern Styling—Rotating Slide Rule Dial

MODEL **\$229.50** Shipped motor freight unless otherwise specified. \$50.00 deposit required on C.O.D. orders.

Fresh out of the Heath Company laboratories, the brand-new "Apache" model TX-1 Ham Transmitter features modern styling and is designed as a handsome companion to the also-new Heathkit "Mohawk" receiver. The "Apache" is a high quality transmitter operating with 150 watt phone input and 180 watt CW input. In addition to CW and phone operation, the "Apache" features built-in switch selected circuitry providing for single-sideband transmission through the use of a plug-in external single-sideband adapter. These Heathkit adapters will be available in the near future. A compact, stable and completely redesigned VFO provides low drift frequency control necessary for single-sideband transmission. An easy-to-read slide rule type illuminated rotating VFO dial with vernier tuning provides ample band spread and precise frequency setting. Simple band-switching control allows flip-of-the-wrist selection of the amateur bands on 80, 40, 20, 15 and 10 meters (11 M with crystal control). The "Apache" features adjustable low level speech clipping and a low distortion modulator stage employing two of the new 6CA7/EL-34 tubes in push-pull class AB operation. Time sequence keying is provided for "chirpless" break-in CW operation.



The final amplifier is completely enclosed in a perforated aluminum shielding for greater TVI protection and transmitter stability. Cabinet comes completely preassembled with top hatch for convenient access without taking chassis out of cabinet. Die-cast aluminum knobs and front panel escutcheons add to the attractive styling of the transmitter. Pi network output coupling matches antenna impedances between 50 and 72 ohms. Incorporates all the refinements necessary with many "plus" features for effective and dependable communications. Shpg. Wt. 115 lbs.

...top quality at lowest prices!

HEATHKIT "MOHAWK" HAM RECEIVER KIT

- All Critical Circuits Prewired and Aligned
- Crystal Controlled Oscillators for Drift-Free Reception

MODEL **\$274.95** Shipped motor freight unless otherwise specified. \$50.00 deposit required on C.O.D. orders.

Outstanding results can be expected with the new "Mohawk" receiver which is designed to combine all the necessary functions required in a high quality communications receiver. A perfect companion for the Heathkit "Apache" transmitter, the "Mohawk" features the same wide-band slide rule type vernier tuning and covers all of the amateur bands from 160 through 10 meters on seven bands with an extra band calibrated to cover 6 and 2 meters using a converter. External receiver powered, accommodations are available for these converters which will be available in Heathkits soon. The "Mohawk" is specially designed for single-sideband reception with crystal controlled oscillators for upper and lower sideband selection. A completely preassembled, wired and aligned front end assures ease of assembly. All critical wiring is done for you insuring top performance. This 15-tube receiver features double conversion with IF's at 1682 kc and 50 kc. Five selectivity positions from 5 kc to 500 CPS. A

bridged T-notch filter is employed for maximum heterodyne rejection. Complete accuracy is obtained with the use of a built-in 100 kc crystal calibrator and the set features 10 db signal-to-noise ratio at less than 1 microvolt input. S-meter and many other fine features built-in for top-notch signal reception. Shpg. Wt. 90 lbs.



HEATH COMPANY

A Subsidiary of  Daystrom, Inc.

BENTON HARBOR 9,
MICH.

HEATHKIT PHONE & CW TRANSMITTER KIT



MODEL
DX-40

\$64.95

The DX-40 incorporates the same high quality and stability as the DX-100, but is a lower powered rig for crystal operation, or for use with an external VFO. Plate power input is 75 watts on CW, permitting the novice to utilize maximum power. An efficient, control-carrier modulator for phone operation peaks up to 60-watts, so that the rig has tremendous appeal to the general class operator also. Single-knob switching covers 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling makes for easy antenna loading, and pi network interstage coupling between the buffer and final amplifier improves stability and attenuates harmonics. A line filter is incorporated for power line isolation. The efficient oscillator and buffer circuits provide adequate drive to the 6146 final amplifier from 80 to 10 meters, even with an 80-meter crystal. A drive control adjustment is provided, and the function switch incorporates an extra "tune" position so that the buffer stage can be pretuned before the final is switched on. A switch selects any of three crystals, or a jack for external VFO. High quality D'Arsonval meter for tuning. Shpg. Wt. 26 lbs.

HEATHKIT DX-100 PHONE & CW TRANSMITTER KIT

MODEL
DX-100

\$189.50

Shipped motor freight unless otherwise specified. \$50.00 deposit required on C.O.D. orders.

You get more for your transmitter dollar when you decide on a DX-100 for your ham shack! Recognized as a leader in its power class, the DX-100 offers such features as a built-in VFO, built-in modulator, TVI suppression, pi network output coupling to match a variety of antenna impedances from 50 to 600 ohms, pi network interstage coupling, and high quality materials throughout. Copper plated 16-gauge steel chassis, ceramic switch contacts, etc., are typical of the kind of parts you get, in assembling this fine rig. The DX-100 covers 160, 80, 40, 20, 15, 11 and 10 meters with a single band-switch, and with VFO or crystal operation on all bands. RF output is in excess of 100 watts on phone and 120 watts on CW, with a pair of 6146 tubes in parallel for the final amplifier, modulated by a pair of 1625 tubes in parallel. VFO tuning dial and panel meter are both illuminated for easy reading, even under subdued lighting conditions. Attractive front panel and



case styling is completely functional, for operating convenience. Designed exclusively for easy step-by-step assembly. No other transmitter in this power class combines high quality and real economy so effectively. Here is a transmitter that you will be proud to own. Time payments are available. Shpg. Wt. 107 lbs.

more fine ham gear from the pioneer



HEATHKIT GRID DIP METER KIT

A Grid Dip Meter is basically an RF Oscillator used to determine the frequency of other Oscillators, or tuned circuits. Numerous other applications such as pretuning, neutralization, locating parasitics, correcting TVI, adjusting antennas, designing new coils, etc. Features continuous frequency coverage from 2 MC to 250 MC, with a complete set of prewound coils, and a 500 ua panel meter. Has sensitivity control and a phone jack for listening to the "Zero-Beat". It will also double as an absorption-type wave meter. Shpg. Wt. 4 lbs.

Low frequency coil kit: two extra plug-in coils extend frequency coverage down to 350 KC.
Shpg. Wt. 1 lb. No. 341-A \$3.00

MODEL GD-1B

\$21.95

HEATH COMPANY

A Subsidiary of Paystrom, Inc.

BENTON HARBOR 9,
MICHIGAN

HEATHKIT ALL-BAND COMMUNICATIONS- TYPE RECEIVER KIT

Ideal for the short wave listener or beginning amateur, this Receiver covers 550 KC through 30 MC in four bands. It provides good sensitivity and selectivity, combined with fine image rejection. Amateur bands are clearly marked on the illuminated dial scale. Features transformer type—power supply—electrical band spread—antenna trimmer—separate RF and AF gain controls—noise limiter—internal 5½" speaker—head phone jack and AGC. Has built-in BFO for CW reception. An accessory power socket is also provided for connecting the Heathkit model QF-1 Q Multiplier. Will supply 250 VDC at 15 ma and 12.6 VAC at 300 ma. Shpg. Wt. 12 lbs. Cabinet: Fabric covered cabinet with aluminum panel as shown part 91-15A. Shpg. Wt. 5 lbs. **\$29.95**



ALL-BAND RECEIVER

HEATHKIT ELECTRONIC VOICE CONTROL KIT

Here is a new and exciting kit that will add greatly to your enjoyment in the ham shack. Allows you to switch from Receiver to Transmitter merely by talking into your microphone. Lets you operate "break-in" with an ordinary AM transmitter. A terminal strip is provided for Receiver and speaker connections and also for a 117 volt antenna relay. Unit is adjustable to all conditions by sensitivity and gain controls provided. Easy to build with complete instructions provided. Requires no transmitter or Receiver alterations to operate. Shpg. Wt. 5 lbs.

MODEL VX-1

\$23.95



ELECTRONIC VOICE CONTROL

HEATHKIT "Q" MULTIPLIER KIT

This fine Q Multiplier is a worthwhile addition to any communications, or Broadcast Receiver. It provides additional selectivity for separating signals, or will reject one signal and eliminate a heterodyne. Functions with any AM Receiver having an IF frequency between 450 and 460 KC that is not AC-DC type. Operates from your Receiver power supply, and requires only 6.3 VAC at 300 ma (or 12.6 VAC at 150 ma), and 150 to 250 VDC at 2 ma. Simple to connect with cable and plugs supplied. Effective Q of approximately 4000 for sharp "peak" or "null". A tremendous help on crowded phone or CW bands. Shpg. Wt. 3 lbs.

MODEL QF-1

\$9.95



"Q" MULTIPLIER

NOTE: \$10.65 WHEN ORDERED WITH AR-3 BECAUSE OF EXCISE TAX.

...in do-it-yourself electronics!

HEATHKIT "AUTOMATIC" CONELRAD ALARM KIT

Designed to give instant warning whenever a monitored station goes off the air, the CA-1 automatically cuts the AC power to your transmitter, and lights a red indicator. Works with any radio receiver; AC-DC—transformer operated—battery powered, so long as the receiver has AVC. A manual "reset" button is provided to reactivate the transmitter. Incorporates a heavy-duty 6-ampere relay, a thyratron tube, and its own built-in power supply. A neon lamp shows that the alarm is working. Simple to install and connect with complete instructions provided for assembly and operation. Shpg. Wt. 4 lbs.

MODEL CA-1

\$13.95



"AUTOMATIC"
CONELRAD ALARM

HEATHKIT VARIABLE FREQUENCY OSCILLATOR KIT

Enjoy the convenience and flexibility of VFO operation by obtaining this fine variable frequency oscillator. It covers 160-80-40-20-15-11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Requires 250 volts DC at 15 to 20 ma, and 6.3 VAC at 0.45 a, available on most transmitters. It features voltage regulation for frequency stability, and has illuminated frequency dial. VFO operation allows you to move out from under interference and select the portion of the band you want to use without having to be tied down to only 2 or 3 frequencies through the use of **MODEL VF-1** crystals. "Zero in" on the other fellow's signal and return his CQ on his own frequency! Shpg. Wt. 7 lbs.

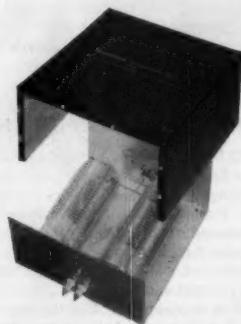
\$19.50



VARIABLE FREQUENCY OSCILLATOR



REFLECTED POWER METER



BALUN COIL

HEATHKIT REFLECTED POWER METER KIT

A necessity in every well equipped ham shack, the model AM-2 lets you check the match of the antenna transmission system, by measuring the forward and reflected power or standing wave ratio. Handles up to one kilowatt of energy on all bands from 160 to 2 meters, and may be left in the antenna system feed line at all times. Input and output impedances for 50 or 75 ohm lines. No external power required for operation. Meter **MODEL AM-2** indicates percentage forward and reflected power, and standing wave ratio from 1:1 to 6:1. Shpg. Wt. 3 lbs.

\$15.95

HEATHKIT BALUN COIL KIT

This convenient transmitter accessory has the capability of matching unbalanced coax lines, used on most modern transmitters, to balanced lines of either 75 or 300 ohms impedance. Design of the bifilar wound Balun Coils will enable transmitters with unbalanced output to operate into balanced transmission line, such as used with dipoles, folded dipoles or any balanced antenna system. Can be used with transmitters and **MODEL B-1**. Receivers without adjustment over the frequency range of 80 through 10 meters. Will handle power inputs up to 200 watts. Shpg. Wt. 4 lbs.

\$8.95

save 1/2 or more . . . with HEATHKITS



FREE 1958 Catalog

Send for this Free informative catalog listing our entire line of kits, with complete schematics and specifications.

Rush Free 1958 catalog.

HEATH COMPANY

BENTON HARBOR 9, MICH.



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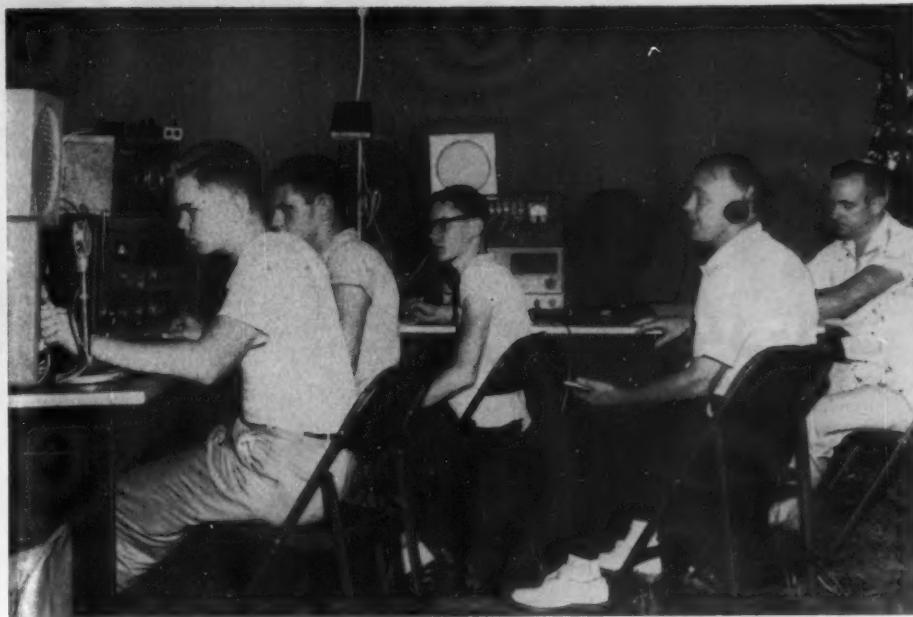
name _____

address _____

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QUAN.	ITEM	MODEL NO.	PRICE

\$ _____ enclosed. Parcel post, include postage—express orders are sent shipping charges collect. All prices quoted are Net F.O.B. Benton Harbor, Mich. and apply to Continental U.S. and Possessions only. All prices and specifications subject to change without notice.



Photograph courtesy of the Old Dominion ARC of South Boston, Va.

For Shack—Hill—or High Water MALLORY Means Dependability...

A rig's got to work right—whether it's in the shack, on your favorite field-day hilltop, or part of your emergency gear. There is no compromise for dependability.

Mallory's years of experience in the manufacturing of electronic components has given them the know-how to manufacture parts that are *known* for dependability.

Take vibrators, for example—Mallory research and design have produced new vibrator contacts that result in up to 100% longer life, reduced arcing and mechanical noise, and fast starting.

Mallory FP capacitors, for service up to

500 working volts—DC, are the only capacitors to feature etched cathodes and fabricated plates for longer life at rated capacity—even under the toughest conditions. The complete line of Mallory transmitting capacitors, for filter, bypass and coupling service, are standards for design and replacement wherever quality and dependability count.

A Mallory Precision Components Catalog ought to be a permanent part of your reference file. You can get a copy by asking your Mallory Distributor—or by dropping a QSL to the Mallory Hamshack, P. O. Box 1558, Indianapolis 6, Indiana.

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SR-34

two and six meter
transmitter/receiver



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New!

hallicrafters "2 and 6"



SR-34
two and six meter
transmitter/receiver

World's first complete two and six meter radio station...
features transistorized, built-in power supply

COMPLETE SPECIFICATIONS

General description: The SR-34 is designed for either AM or CW and combines, for the first time in one compact package, the complete functions of a two and six meter radio station. It operates on 115-V. A.C., 6-V. D.C., or 12 V. D.C. and features a highly efficient transistorized power supply for the 6 and 12 volt operation.

Exclusive features: The perfect unit for short-range portable, fixed or mobile communication, the SR-34 meets—and exceeds—F.C.D.A. matching-band specifications. The crystal sockets and transmitter tuning controls are concealed behind a panel which may be sealed to prevent tampering. Instantaneous selection of desired voltage possible and also "crossbanding" between the two and six meter bands. The specially designed cover has mounting clips for two-band antenna, owner's microphone, and cords.

Both receiver and transmitter may be used for G.W.; key jack and adjustable B.F.O. are provided. Drip-proof case is specially designed for safe outdoor use.

The transmitter is crystal-controlled; up to four crystals may be switch-selected. A fifth position on this switch permits external V.F.O. operation. Band selection also is front-panel controlled.

The receiver is a double conversion superhetero-

dyne, having a quartz crystal controlled second oscillator. This offers outstanding selectivity and high image rejection. Highest stability is obtained through separate oscillator and R.F. sections for each band.

All receiver functions provided—S-meter B.F.O., ANL, etc. Sensitivities average 1 microvolt on both bands. Transistorized power supply eliminates noisy, erratic operation encountered with vibrator-type power supplies.

Front Panel Controls: *Receiver:* Band Selector (49.54 mc., 143.5 to 148.2 mc.); Main Tuning; Sensitivity; Audio Volume; B.F.O. Pitch; Squelch Level; Headphone Jack. *Transmitter:* Function Switch (P.A., Rec., Cal., AM, CW); Power On/Off; Band Switch; Crystal Selector and V.F.O.; Oscillator Tuning; Doubler Tuning; Tripler Tuning; Final Tuning; Final Loading; Meter Switch.

Power output: 6 to 7½ watts on 2 meter, and 7 to 10 watts on 6 meter AM or CW, 100% mod. negative peak clipping. *Rear Apron:* Speech input level control; key jack; P.A. speaker terminals; mic. selector (high Z or carbon); mic. input; A.C. and D.C. fuses; power plug.

Available with convenient terms from your Radio Parts Distributor.

Export Sales: International Operations—Raytheon Manufacturing Co.—Waltham, Massachusetts



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are born at...*

In our 25th year of service

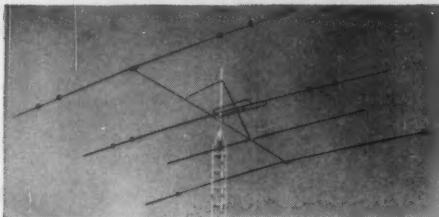
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THESE GREAT SERIES OF

Hy-gain trap tribanders

the FULL-SIZE trap tribanders



the 3-element trap tribander

9975

The 3-Element Tribander shown above is now considered as the standard of performance in the field of amateur communications. F/B Ratio: approx. 25 db. Forward gain: 8 db. average.

6950

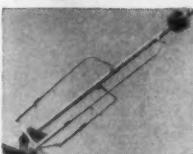
the 2-element trap tribander

For use in limited space when top quality transmission is desired on 10, 15 & 20M. Single transmission line. F/B Ratio: approx. 18 db. Forward gain: 5.8 db. average.

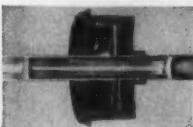
39500

the 5-element trap tribander

One of the finest, highest gain, rotatable arrays available. Heavy duty construction. Use of 36' x 31" rectangular aluminum boom. F/B Ratio: approx. 25 db. Forward gain: 12 db. average.



Perfect 1:1 SWR is made possible by the new, pre-calibrated Triaxial Gamma Match System with coaxialized forming reactance cancelling capacitors built in. Exceptional band width maintains low SWR over entire band. Coax connector for 52 ohm feed line included. Gamma rod and capacitor section calibrated for exact setting over each band. No external baluns, antenna tuners or matching networks needed.



The automatic switch action of the Insu-Traps is employed in both series of tribanders. They act as insulators at their resonating frequencies, but allow radio energies of other frequencies to pass, isolating various sections of the antennas. Mechanically and electrically stable, the traps are hermetically sealed at the factory in polyethylene cover and cap, completely waterproof. HigQ construction on styron form. Guaranteed for the life of the beam. The Mini-Tribander Traps are specially weight-designed for wind loading efficiency.

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the **Hu-gain**

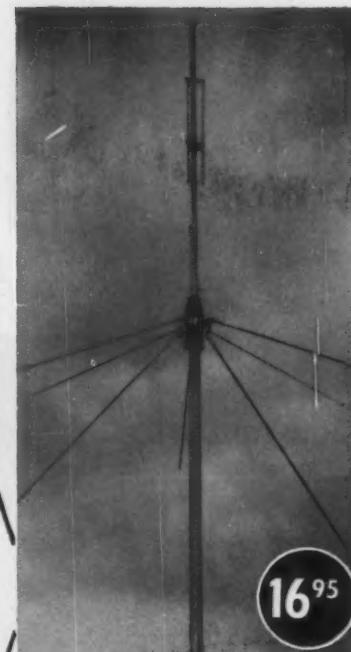
MULTI-BAND TRAP VERTICALS

12-AV (10, 15 & 20 METERS)

For automatic coverage of the 10, 15 and 20 meter bands. Insu-Traps isolate the various sections of this vertical, developing $\frac{1}{4}$ -wave resonance on each band. 52 ohm coaxial feed. Less than 2:1 SWR on all bands. Overall height: 14 ft. No "guesswork" assembly with step-by-step construction manual.

26-AV (2 & 6 METERS)

The Automatic Vertical for the 2 and 6 meter bands, with the new "sleeve decoupling" principle. Complete with ground plane. Overall height of Vertical and length of ground plane: 5 ft. Less than 2:1 SWR both bands. 52 ohm coax feed. Complete instructions.



16.95

DECOUPLING SLEEVE

Radically new Decoupling Sleeve automatically isolates various sections of the 26-AV, developing $\frac{1}{4}$ -wave resonance on each band. Complete ground plane is also dual resonant for both bands. Totally unaffected by weather; extremely efficient at high frequencies.

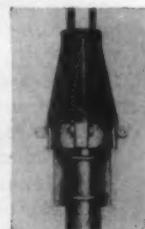
INSU-TRAP

Acting as insulator at resonant frequencies, but allowing radio energies of other frequencies to pass freely. Automatic switch action isolates various sections of the vertical to make them proper length for each band. Mechanically and electrically stable. Entire trap circuit enclosed in carbon activated polyethylene cover and cap. Completely weatherproof, air tight.



BASE

Nylon base assembly makes possible self-support. Cast aluminum mounting bracket and adjustable for various sizes of masts, with weather protected internal coaxial fitting. Electrical connections factory sealed.



COMPLETE LINE

Model 26-AV (2-6M)	\$16.95
Model 12-AV (10, 15, 20M)	\$19.95
Model 14-AV (10-40M)	\$27.95
Model 18-AV (10-80M)	\$69.50
12-AV Mount Kit	\$ 8.95
14-AV Mount Kit	\$ 9.95

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AN/URT-17

MODEL GPT-750(D)

- SINGLE SIDEBAND — SUPPRESSED CARRIER
- INDEPENDENT SIDEBAND — SUPPRESSED CARRIER
- DOUBLE SIDEBAND — FULL CARRIER — SUPPRESSED CARRIER
- FREQUENCY SHIFT
- CW-MCW-AM

TMC

The TMC Model SBE-1, Mode Selector, Transmitting, is a universal exciter permitting the transmission of any intelligence on Single or Double Sideband, with or without carrier.

The exciter may be used for simultaneous or independent transmission of intelligence on either upper or lower sideband. For example: A voice channel can be transmitted on the upper sideband while tone multiplex is being transmitted on the lower sideband.

The SBE-1 provides the following commonly known types of operation:

1. Conventional Double Sideband, AM, with the additional advantage of carrier level control.
2. Conventional Single Sideband with adjustable carrier insertion.
3. Conventional Interrupted Carrier, CW, or Sideband Tone CW.
4. Independent Sideband transmission with adjustable carrier insertion.

From the above paragraphs, it should be apparent that the SBE-1 provides transmission which is compatible with any of the current "controversial" systems.

The TMC Model GPT-750, Radio Transmitter provides radio telephone, telegraph, frequency shift and facsimile operation on all frequencies within the range of 2 to 32 Mc.

The GPT-750 is a field proven equipment, service tested, nomenclatured (AN/URT-17) and approved for service use. This transmitter has been used for fixed plant, mobile and shipboard operation and provides 1000 watts output CW and FS, 750 watts output radio telephone (high level modulation) and 750 watts output, PEP, single sideband, all on a continuous commercial service basis. Band switching in all stages.

WRITE FOR
BULLETIN 174C

THE TECHNICAL MATERIEL CORPORATION



PAL-350

LINEAR POWER AMPLIFIER



- 350 Watts 2 tone PEP
- Parallel 4X250B's
- Continuous Commercial Service
- SSB · ISB · DSB · AM · CW · MCW
- 2 to 32 Megacycles
- BANDSWITCHING
- PI-NETWORK 50 to 70 ohm unbal.
- Applicable to Mobile

WRITE FOR
BULLETIN 204

THE TECHNICAL MATERIEL CORPORATION

Put America Back To Work!
10% PRICE SLASH DURING MAY AND JUNE!



"I am now using the Gotham V80 vertical antenna with only 55 watts, and I am getting fantastic reports from all over the world". VP1SD

ALL-BAND VERTICAL ANTENNAS

GOTHAM'S sensational new vertical antennas give unsurpassed multi-band performance. Each antenna can be assembled in

less than two minutes, and requires no special tools or electronic equipment. In the V160, resonance in the 160, 80, 75, and 40 meter bands is secured through use of the proper portion of the loading coil. Yet, when the coil is eliminated or bypassed, the V160 will operate on 20, 15, 10 and 6 meters! The same idea applies to our V80 and V40 multi-band verticals. No guy wires needed; rugged, occupies little space, proven and tested.

Simple design and superior materials give all-band operation, and effective, omni-directional radiation. Gotham verticals are rugged, with low initial cost and no maintenance. Guaranteed Gotham quality at low Gotham prices. Perfect for the novice with five watts or the expert with a kilowatt.

DEDUCT 10%
DURING MAY AND JUNE



QUALITY MATERIAL

Brand new mill stock aluminum alloy tubing with Aluminite finish for protection against corrosion. Loading coils made by Barker & Williamson.

ALL-BAND OPERATION

Switch from one band to another. Operate anywhere from 6 to 160 meters. Work the DX on whatever band is open.

EASY ASSEMBLY

Less than two minutes is all you need to put your vertical together. No special tools or electronic equipment required. Full instructions given.

SIMPLE INSTALLATION

Goes almost anywhere. On the ground, on the roof, or outside your window.

AMAZING PERFORMANCE

Hundreds of reports of exceptional DX operation on both low and high power. You will work wonders with a Gotham vertical.



PROVEN DESIGN

Over a thousand Gotham verticals are on the air — working the world and proving the superiority of Gotham design.

AND THE PRICE IS RIGHT!

"I worked LU3ZS on Half Moon Island in Antarctica on Dec. 26 at 21150 Ke. I was using my Gotham V80 vertical antenna and only 35 watts." KN5GLI

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WORK THE WORLD



GOTHAM 1805 PURDY AVENUE MIAMI BEACH 39, FLA.

Airmail Order Today — We Ship Tomorrow

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1805 PURDY AVE., MIAMI BEACH, FLA.

Enclosed find check or money-order for:

V40 vertical for 40, 20, 15, 10, 6	meters.....\$14.95	<input type="checkbox"/>
meters.....\$14.95	<input type="checkbox"/>	
V80 vertical for 80, 75, 40, 20, 15,	10, 6 meters.....\$16.95	<input type="checkbox"/>
10, 6 meters.....\$16.95	<input type="checkbox"/>	
V160 vertical for 160, 80, 75, 40,	20, 15, 10, 6 meters.....\$18.95	<input type="checkbox"/>
20, 15, 10, 6 meters.....\$18.95	<input type="checkbox"/>	

Name.....

Address.....

City.....Zone.....State.....

Put America Back To Work!
10% PRICE SLASH DURING MAY AND JUNE!

YOU COULD WORK WONDERS IF YOU HAD A GOTHAM BEAM!



TYPE OF BEAM. All Gotham beams are of the full half-wave plumber's delight type; i.e., all metal and grounded at the center. No wood, tuning stubs, baluns, coils, or any other devices are used.

MORE DX CONTACTS

GAIN. Gotham beams give the maximum gain obtainable. Our 2-element beams give a power gain of four (equivalent to 6 db.); our 3-element beams give a power gain of seven (8.1 db.); and our 4-element beams give a power gain of nine (9.6 db.).

THOUSANDS IN DAILY USE

MATCHING. Matching of the transmission line to the beam is extremely simple and quick. No electronic equipment or measuring devices are required.

ALCOA QUALITY ALUMINUM

ASSEMBLY AND INSTALLATION. No special tools are required for assembly and installation. Entire job can be done by one man in less than an hour. Full instructions are included with each beam.

CONSISTENT PERFORMANCE

MAST. Any Gotham beam can be mounted on a simple pipe mast. Diameter of the pipe should be between $\frac{1}{4}$ " and $\frac{1}{2}$ ".

YOU WILL WORK THE WORLD

STANDARD AND DELUXE BEAMS. Standard beams in the 6, 10 and 15 meter bands use $\frac{5}{8}$ " and $\frac{3}{4}$ " tubing elements; the deluxe models for these bands use $\frac{7}{8}$ " and 1". In 20 meter beams, the standard has a single boom, while the deluxe uses twin booms.

TRIBANDER BEAMS

6-10-15 TRIBANDER.....\$39.95
10-15-20 TRIBANDER.....49.95

Do not confuse these full-size tribander beams with so-called midgets. The Tribander has individually fed (52 or 72 ohm coax) elements and is not frequency sensitive, nor does it have baluns, coils, traps, or other devices intended to take the place of aluminum tubing. The way to work multi-band and get gain is to use a Gotham Tribander Beam.

TWO BANDER BEAMS

6-10 TWO BANDER.....\$29.95
10-15 TWO BANDER.....34.95
10-20 TWO BANDER.....36.95
15-20 TWO BANDER.....38.95

Each Two Bander has twin 12' booms, and full-size half-wave elements. $\frac{5}{8}$ " and 1" aluminum alloy tubing, all castings and fittings are supplied. Assembly is easy.

You could work KC4USA in the Antarctica with only 90 watts on 15 meters, as W4SK did.

You could work over 100 countries with a three element 10 meter beam, and be a top man on the frequency, like WØDEI.

You could work terrific skip and DX with reports of 20 over 9, with as little as 36 watts input on 20 meters, as W. E. Woods did.

You could work 29 states in three months on six meters, with low power, as K2LHP did.

DEDUCT 10%
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TWO BANDER BEAMS			
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10-15 TWO BANDER.....	<input type="checkbox"/>	34.95	
10-20 TWO BANDER.....	<input type="checkbox"/>	36.95	
15-20 TWO BANDER.....	<input type="checkbox"/>	38.95	

TRIBANDER			
<input type="checkbox"/> 6-10-15	\$39.95	<input type="checkbox"/> 10-15-20	\$49.95

2 METER BEAMS			
<input type="checkbox"/> Deluxe 6-Element	9.95	<input type="checkbox"/> 12-El	16.95

6 METER BEAMS			
<input type="checkbox"/> Std. 3-El Gamma match	12.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 3-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Std. 4-El Gamma match	16.95	<input type="checkbox"/> T match	19.95
<input type="checkbox"/> Deluxe 4-El Gamma match	25.95	<input type="checkbox"/> T match	28.95

10 METER BEAMS			
<input type="checkbox"/> Std. 2-El Gamma match	11.95	<input type="checkbox"/> T match	14.95
<input type="checkbox"/> Deluxe 2-El Gamma match	18.95	<input type="checkbox"/> T match	21.95
<input type="checkbox"/> Std. 3-El Gamma match	16.95	<input type="checkbox"/> T match	18.95
<input type="checkbox"/> Deluxe 3-El Gamma match	22.95	<input type="checkbox"/> T match	25.95
<input type="checkbox"/> Std. 4-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 4-El Gamma match	27.95	<input type="checkbox"/> T match	30.95

15 METER BEAMS			
<input type="checkbox"/> Std. 2-El Gamma match	19.95	<input type="checkbox"/> T match	22.95
<input type="checkbox"/> Deluxe 2-El Gamma match	29.95	<input type="checkbox"/> T match	32.95
<input type="checkbox"/> Std. 3-El Gamma match	26.95	<input type="checkbox"/> T match	29.95
<input type="checkbox"/> Deluxe 3-El Gamma match	36.95	<input type="checkbox"/> T match	39.95

20 METER BEAMS			
<input type="checkbox"/> Std. 2-El Gamma match	21.95	<input type="checkbox"/> T match	24.95
<input type="checkbox"/> Deluxe 2-El Gamma match	31.95	<input type="checkbox"/> T match	34.95
<input type="checkbox"/> Std. 3-El Gamma match	34.95	<input type="checkbox"/> T match	37.95
<input type="checkbox"/> Deluxe 3-El Gamma match	46.95	<input type="checkbox"/> T match	49.95

(Note: Gamma-match beams use 52 or 72 ohm coax.)

T-match beams use 300 ohm line.)

NEW! RUGGEDIZED HI-GAIN 6, 10, 15 METER BEAMS

Each has a TWIN boom, extra heavy beam mount castings, extra hardware and everything needed. Guaranteed high gain, simple installation and all-weather resistant. For 52, 72 or 300 ohm transmission line. Specify which transmission line you will use.

<input type="checkbox"/> Beam #R6 (6 Meters, 4-El)	\$38.95
<input type="checkbox"/> Beam #R10 (10 Meters, 4-El)	40.95
<input type="checkbox"/> Beam #R15 (15 Meters, 3-El)	49.95

Name.....

Address.....

City.....Zone.....State.....



Station Activities

(Continued from page 88)

NYS C.W. meets on 3815 kc. at 1800, ESS on 3590 kc. at 1800, NYS Phone on 3925 kc. at 1800, NYS C.D. on 3509.5 and 3993 kc. at 0900 Sun., TCPN 2nd Call Area on 3970 kc. at 1900, SRPN on 3980 kc. at 1000, LSN on 3970 kc. at 1600. Congratulations to K2SIL on making BPL for the second month in a row. The Syracuse V.H.F. Club elected K2JIM, pres., K2PKL, vice-pres., EMW, secy.-treas., and RHQ, act. mgr. EMW's DX total now stands at 224. K2AOQ dropped the "N" K2UF and K2TR are going mobile. New hams in Clyde are K2NIOY and K2NKKZ. K2NDGU received the Novice award in the V.H.F. Contest. Lynn has worked ten states on 2-meter c.w. using his feet. K2SIL has received an A-1 Operator Award. ATC and EUP are making test runs on their equipment for Field Day. The SWNYHFA has been donated space for meeting in the basement of the Machias town hall. There also is a spot for a 6-meter antenna 80 feet up. The RAWNY Board of Directors elected TKO, pres.; CUU, vice-pres.; K2KYT, corr. secy.; PPY, rec. secy., and K2GBY, treas. PFI has a new HT-32. K2UFB is building an 813 d.b. rig. K3CEH is remodeling his shack. K2PVK and K2TYG are active on 6 meters. K3LXB has 200 watts on 6 meters and a converter for 220 as well as for 420 Mc. YYI has worked Africa and South America on 6 meters. The Niagara Frontier DX Assn. has obtained its own distinctive QSL cards. K3CZO, K2MBJ, PPY, GBX, VRG and K2CLF organized a 2-meter mobile net for the Nephrosis Charity Drive and collected several thousand dollars in the Buffalo area. LXE expects to have a kilowatt on 2 meters by the time you read this. K2HUK now has 60 countries on s.s.b. Appointments are contingent upon regular reporting on a monthly basis to the SCM. Your SCM would like to be on the mailing list for club meetings and special events. K2ERP, the club station at the Kenmore HSR, has been appointed OBS. K2KIR has been renewed as OO. Traffic: K2SIL 705, IYP 436, KIR 305, W2RUF 246, K2RYH 233, W2ZRC 148, K2UZJ 99, RTN 79, JBX 69, GOU 58, LGJ 58, W2BKC 57, FEB 44, K2BZB 34, YJN 26, W2OE 25, K2KTH 23, KQC 22, W2RQF 21, K2GKZ 19, HUK 16, UNZ 14, RIC 2, DEM/2 1, W2EMW 1, K2RHZ 1.

WESTERN PENNSYLVANIA—Acting SCM, Anthony J. Mroczka, W3UHN—SEC: OMA, RM: GEG and NUG, PAMs: AER and TOC. The WPA Traffic Net meets Mon. through Fri. at 1900 EST on 3585 kc. A new OBS appointed is SIR. Congratulations to HXF on receiving a WAC certificate for two-way s.s.b. ZHQ has worked his 100th country and now is awaiting confirmations. The Coke Center RC, NAV, now is on 10 and 160 meters. QVV is transmitting good quality TV to MQT, a distance of 11 miles. New officers of the Conemaugh Valley ARC are BST, pres.; SNN, vice-pres.; IWT, secy.; BLR, treas.; UYI and TIF, trustees. WRC, MIM and UIY are using Wonder Bar antennas on 10 meters. JIA has a Valiant, LXQ and WRA are sharing c.w. training sessions on e.d. drills. K3ARV has a new HQ-100. TOC is having v.f.o. trouble. Up Erie way: LOS worked UPOLIS, a Russian located on a floating ice base near the North Pole. The RAE boys had Mr. Schlaudecker of Bliley Crystals, as guest speaker. The Washington County ARC had Director YA as a guest at the April meeting. PBN now is working s.s.b. LOD is relaying emergency traffic for K4IIS. GJY is convalescing slowly. LXU, LXQ, YCG, BZR and K2AGF are doing swell jobs on the WPA Traffic Net. The Uniontown ARC, PIE, will hold its annual stag-fest June 21. Traffic: (Mar.) W3WIQ 1020, LXU 288, BZR 147, K3AGF 61, W3LSS 60, UHN 47, YCG 24, LOD 6, WRE 6, K3NCCZ 2, W3GJY 2, TOC 2. (Feb.) W3YCG 25, KNQ 9.

CENTRAL DIVISION

ILLINOIS—SCM, Edmond Metzger, W9PRN—Asst. SCM: Grace V. Ryden, GME, SEC: HOA, Cook County EC: HPG, RM: MAK, PAM: RYU. Section net: ILN meets Mon. through Sat. on 3515 kc. at 7 p.m. Congratulations to the new Southern Illinois Weather Net under the helm of RNM and BJE. The Easter Saturday twister could have been more disastrous if this net had not been organized. EX-DL400 is now K9HGP. K9CAZ is mobilizing with a DX-100 with a 600-watt generator mounted in the trunk. RYU reports that the Quad City gang helped the local police in the routing of a 30-mile-long parade by mobilizing AKE, UCZ and DGV. K9AKS, K9EUF, K9CHZ, K9IDN and K9HCV on 6-meters. Comet Communicators. He also writes that UCZ is net control for the Rock Island RACES. JMF worked 2IDZ/VE8 on 6 meters located

at Cape Parry on the Amundsen Gulf, which is north of the Arctic Circle. BON's new rig has passed the test and is active on 50 Mc. K9BAU, assisted by YEU and LTI, gave a lecture demonstration to the Galesburg Jr. Chamber of Commerce with a link to K9BEI, who used 20-meter s.s.b. to work Texas. K9EGJ, president, and K9GDQ, trustee, are officers of the new Von Steinen High School (Chicago) Radio Club. The Chicago V.H.F. Club and the YLRL held a joint meeting on May 13. New Novices heard were K9NLRJ and K9NLIW. IDA is busy making plans to visit his son, CXT, at Monterey, Calif. 5ZWR/9 is now located permanently in Joliet. DSO, chief of the 9-QSL Bureau, wants to remind the gang to please send in addressed envelopes as there are many cards on file but no envelopes in which to forward them. The Peoria Area Amateur Radio Club's membership drive now totals 102 and K9IUI reports that they will go over the 150-member goal soon. BON is now celebrating his 28th year of amateur radio with the same call. CSW reports that the North Central Phone Net handled traffic with a total of 514. MAK also reports that the ILN handled 400 messages in 31 sessions during March. IJEQ, ARRL Headquarters Technical Assistant, spoke before the Chicagoland Mobile Radio Club on Apr. 25. LDU has been appointed new Assistant Manager of the IEN. JVD is back again pounding brass after a two-week hospital vacation. The Y-Rad Club of Sterling passed K9NLLAC, K9KZR, K9NLAB and K9NLA during its recent code class. Many items were received regarding the Annual Field Day Event. Some have very elaborate plans, but the main idea is to get out and use that emergency equipment. Mr. Raredon and Mr. Stanton, of the State Civil Defense, met with the St. Clair County Control Center at Belleville with EC's and Radio Officers from nearby counties attending. K9NLLD and his Regional Novice Net have increased the roster of members by a large percentage since it was inaugurated. Traffic: (Mar.) W9DO 1376, WBE 347, PCQ 233, FAW 142, IDA 108, K9AXL 73, JIN 69, GDQ 59, W9CSW 55, CTZ 51, BUK 40, PHE 21, RYL 21, YFO 16, K9NLLD 14, W5ZWR/9 8, W9SKR 4, JZK 3, SXL 2, TZN 2, BON 1, (Feb.) W9IDA 144, BON 1, (Nov.) W9JSK 40.

INDIANA—SCM, Arthur G. Evans, W9TQC—Traffic nets: IFN, 3910 kc., 0800 Dy, and 1800 Mon. through Fri.; QIN 3656 kc., 1900 Dy; RFN, 3656 kc., 0800 Sun. BDG is now OPS and ORS. Other OPSs are K9BXF, ENU, K9GBB, MLF and TQX. CWG is a new OES. New officers of the Key and Mike ARC at New Albany are HEL, pres.; UVD, vice-pres.; K9GCE, secy.-treas.; Bill Houghton, Pub. The IRCC Hamfest will be held at the Tippecanoe County Fair Grounds July 20. Pre-registration is \$1.25. Mail to Betty Timberlake, LYU, 1915 Central Street, Lafayette. New General Class calls are LYU and K9HYV at Michigan City, KSP at Indianapolis and JIB at Indianapolis. JIB made WAS on 40 and 15 meters while a Novice, K9AYI is justifiably proud of a 30-w.p.m. Code Proficiency sticker. New at Cambridge is K9EYD, a former W6. DGA is coordinating the various emergency communications systems of RACES, AREC and the clubs in the Evansville Area. EJC is working on a d.b. rig. K9EOH is building a 5894 rig for 420 Mc. K9CFG received signals from 35 miles away on a transistor 6-meter receiver. FGX received a DXCC certificate. K9AQF is building a 500-watt c.w. rig for 2 meters. MLF has a new HQ-110 and is building a rig for 6 meters. MHP is on 220 Mc. with modulated oscillator. CC operated 4/4 at Ft. Meyers, Fla., for two months. SWD reports IFN morning traffic as 243, evening 224, for a total of 467. JOZ reports a count of 255 for QIN. RFN traffic as reported by TT WBS 92. EHZ reports traffic as 44 for CAEN. The Indianapolis RC is sponsoring the publication of a Marion County Ham Directory, edited by TGH and published by K9EUD. Traffic: (Mar.) W9NZZ 966, JOZ 681, TT 292, VAY 220, BDG 213, ETM 173, EHZ 105, TQC 105, K9AYI 92, W9ENU 82, RTH 76, GJS 71, SWD 65, K9HMIN 26, W9DOK 56, DGA 53, UQP 50, HUF 44, K9GBB 40, W9WHL 36, BUQ 35, HXR 34, VNV 33, K9EOI 29, W9UMS/6 29, BHR 28, BRW 26, K9EOJ 26, W9IMU 26, CC 23, K9EOH 23, W9HRW 23, EGQ 20, EGV 20, SVZ 20, SNQ 19, WID 18, QR 17, YYX 17, WAU 15, MLF 14, PQZ 14, QYO 12, EJW 11, NTA 9, NTR 9, K9AOM 8, DWK 8, W9MMY 7, CPZ 6, NH 6, CDQ 5, K9HDV 5, W9AMW 4, K9GSV 4, W3LYU 4, K9NLLD 3, K9AUE 1, (Feb.) W9SVL 50, QYQ 19, WTY 14, K9EOH 8, W9PQZ 7.

WISCONSIN—SCM, George Woids, W9KQB—SEC: YHW. PAMs: NRP and AJU. RM: K9EIQ and W9FPC. New appointees: K9ELT as OO Class III and IV, UTV as OO Class III and IV; WMQ and CBE as ORSs; FFC as RM; K9GAJ as OES; BEW and (Continued on page 110)

DUAL and TRIPLE CONVERSION! SINGLE SIDEBAND!



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Another great new receiver from Hammarlund—an outstanding SSB amateur receiver offering the best features of the finest SSB converters and hottest amateur receivers—all wrapped up in a single, beautiful superheterodyne receiver.

Techron Timer, \$10 extra

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- 17-tube superheterodyne
- Dual and triple conversion
- 6, 10, 15, 20, 40, 80 and 160-meter amateur bands.
- 60 db adjustable notch filter
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- Selectable upper, lower or both sidebands
- 100 KCS crystal calibrator
- Fast attack selectable AVC
- and everything else to make it the most tremendous thing that ever happened to amateur SSB reception and at a price that beats them all!



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MORE than 10,000 amateurs take an active part in the administration and operation of the League — the elected Directors, Vice-Directors and Section Communications Managers and their assistants, the Emergency Corps leaders, the traffic net directors, the QSL Managers, the Official Observers and other station appointees and the officers of a thousand affiliated clubs. With such strong, democratic cooperation amateur radio has reached new peaks of achievement and recognition. Aren't you proud to belong?

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RHS as ECs. RQM has a new TVI-proofed kw. final with 304TLs and is up to 189 countries worked. The v.h.f. group in Green Bay is very active. LYX worked Milwaukee on 2 meters with a Gonset and a five-element beam. IMQ has a new 6N2. The Wisconsin Slow-speed Net now is in operation on 3620 kc. at 1830 CST Mon. through Fri. Credit goes to SAA and FFC for its start and good attendance. K9CEF, the DX Tests among the MRAC members, both phone and c.w. QYV made 76,593 points in the DX Tests and rebuilt the final during the contest. DYG made over 1700 points in the YL/OM Contest. OMZ and WZL were the Milwaukee YLs active during the Tests. K9GYG has his Wonder Bar beam on a 50-ft. tower at his Camp Wild Rose home. CCO is now in VK-Land with the Navy. The Mancorad Club has started its summer activities with a banquet, auction and 10-meter transmitter hunt. ZJW has a 1st-class commercial phone license now. K9HRJ, U. of W.'s only YL operator, had 114 phone contacts during the YL/OM Test. ZQA has his WAC. YT is 103 for DXCC in 6 1/2 months. KXK has a new 75A-4 and his WAZ with a JT1AA contact. There is high activity in the Blackhawk Club of Janesville. DTM worked VP7-Land on 160 meter c.w. K9LMX is active on WIN. 8RMF/9, MARS operator at Triax Field, is busy on the c.w. traffic nets. K9GAJ, IQO, IKM, W9GFL and LST are very active OESs. OTL/9 is demonstrating at the local schools. Traffic: (Mar.) W9CXY 1157, K9GDF 291, ELT 179, AEQ 138, W9YT 112, SAA 98, K9DTK 82, W9FFC 82, DYG 58, KQB 32 NRP 28, K9GYG 26, W9GFL 20, CBE 19, OTL 17, ERW 16, K9LMX 14, W9SIZ 14, 8RMF/9 13, W9MWQ 6, K9CEF 5, IQO 2. (Feb.) W9YT 36, PJT 10.

DAKOTA DIVISION

NORTH DAKOTA—Acting SCM, Arnold L. Oehlson, W9VCL—We are sorry to report that our recently-elected SCM, Rev. C. Bonifas, UBG, has been called to serve his church at St. Charles Seminary, Carthagena, Ohio. We wish "Butch" all the luck in the world at his new QTH. KLC is a new PAM. K9CCA is a new net control on the 75-Meter Phone Net. The North Dakota C.W. Net has discontinued activities for the summer. A new amateur at Devils Lake is David Thompson, KN9OBO. Dave is the only North Dakotan to win honorable mention in this year's Westinghouse Search For Talent. UBB has a new 20A and is building a linear amplifier. The boys around Sharon, N. D., are planning a hamfest to be held at Red Willow Lake on June 15. Traffic: K9GGL 23, W9JBM 19, YCL 4.

SOUTH DAKOTA—SCM, Les Price, W9FLP—Asst. SCM: Gerald F. Lee, 6VKY, SCM assistants: FKE and NEO. SECs: YOM and GOE. PAM: SCT. PAM for 2 meters: RSP, RM; GWS. The S.D. 75-Meter (evening) Phone Net had 36 sessions (ZLB 6, SCT 17, CTZ 3, GQH 1, GWA 3, EXX 6); 35 sessions reported. QNI 1045, high 44, low 16, average 29.857; traffic 73, high 8, low 6, average 2.085; informals 109, high 8, low 6, average 3.114. The S.D. 40-Meter Phone Net had 25 sessions (EXX 3, K9INZ 2, LXP 2, NNX 6, K9DPD 6, SCT 1, K9APZ 4); QNI 496, high 24, low 14, average 19.84; traffic 89, high 9, low 6, average 3.56; informals 39, high 7, low 6, average 2.36. The 75-Meter S.S.B. Net (FKE and NEO as NCSS) had 31 sessions: QNI 541, high 31, low 11, average 17.5; OTC 34, high 5, low 6, average 4.7. The S.D. 75-Meter WX Net (ZWL and U9S as NCSS) had 26 sessions: QNI 465, high 23, low 14, average 17.8; OTC 471, high 22, low 13, average 18. W9SVI/K9ARF have a new SX-101. Martha reports that the Weather Net helps the Weather Bureau with their forecasts. The XYL Club of Rapid City met with Doris Narum, the XYL of OSQ, on Mar. 20. K9AZD is in the army. Traffic: W9ZWL 619, SCT 360, BMQ 182, DVB 32, NEO 48, CTZ 26, EXX 26, K9HSW 26, W9BQR 24, AZJ 22, FLP 20, FJZ 16, K9ATZ 11, W9ZLB 10, DKJ 9, DIY 8, K9CMX 6, KXR 6, W9NNX 5, TRU 4, KZC 3, K9MEH 3, W9NIN 3, K9IAW 2, KLR 2, LXH 1.

MINNESOTA—SCM, Robert M. Nelson, W9KLG—SEC: WVO. The prize winners in the March Minnesota QSO Party were K9IDV in the under-150-watt class, OPX in the over-150-watt class and VOA/mobile in the emergency power class. HRY and WXJ, both of Duluth, made DXCC on phone. An AREC—civil defense demonstration was given by the Triangle Radio Club (Mound) at a local hobby show, at which the club's 6-meter mobiles proved their readiness for emergencies. New officers of the St. Paul Mobile Radio Club are K9CAE, pres.; FGN, 1st vice-pres.; K9AXA, 2nd vice-pres.; K9HCD, secy.; and K9HUA, treas. K9MQM is a new brasspounder at Worthington. K9HJC is on phone with 28 watts. RGR has left for service with the Army. We are glad to hear that PBY is home after a session in the hospital. K9ERO is "shopping around" for a kw. rig, after selling his

(Continued on page 118)

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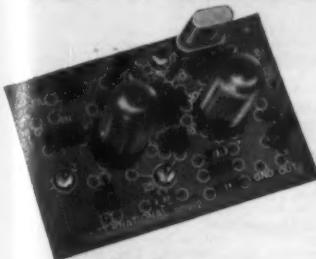


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CIRCUIT: Designed to operate into a load capacitance of 32 mmf on the fundamental between 1500 KC and 15 MC. Designed to operate at anti-resonance on 3rd overtone modes into grid circuit without additional capacitance load. 5th overtone crystals designed to operate at series resonance. (Write for recommended circuits)

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(FA-9 Fits Same Socket as FT-243)		
FREQUENCY RANGE	TOLERANCE	PRICE
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15 MC-29.99 MC	.01%	\$ 3.00
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NOTE: The FA units will not necessarily have the correct correlation for Commercial use.
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DX-100. **KSDIA**, net manager, wants more Novices to join **MJN**, which meets Mon., Wed., and Fri. at 1700 local time, with NCS on 3690 kc. **KSDIV** is now another NCS on **MJN**. **YPN** has a 20-meter beam up using the new CDR Ham-M Rotor. **GQU** has a Wonder Bar antenna. The former **MVH** is operating **KZ3IF**. **Chalm Zone**, on 20 meters, **KGCGN** made **BPL** and has received his Tenth Regional Net certificate. **SFU** has received the DXCC Award. The Mankato Area Radio Club re-elected **RAK** as president. New officers are **TZB**, vice-pres.; and **RNY**, secy. Remember, most Minnesota Nets have changed to Daylight Saving Time. **Traff:** (Mar.) **KGCGN** 221, **WB8KLG** 197, **WB8SH** 6, 109, **WB8KJZ** 86, **KSDIV** 75, **WB8RQJ** 73, **QDL** 59, **KG8VXZ** 48, **WB8WMA** 38, **KD8JIA** 30, **WB8ALW** 23, **TCK** 23, **UMX** 23, **QVR** 22, **KEPTE** 20, **WB9JYK** 20, **WCD** 20, **OJG** 19, **LST** 18, **OPX** 17, **DQL** 14, **MBD** 12, **BUO** 11, **KN8NPKY** 11, **WB8OET** 11, **DQL** 11, **KRAE** 8, **KED** 7, **WB8BVD** 7, **KN8NMJ** 6, **WB8UCV** 5, **IRJ** 4, **NV4** 4, **FGP** 3, **KN8SV** 3, **JCF** 2, **JNX** 2, **KN8LBA** 2, **ORK** 2, **KG8KJL** 1. (Feb.) **WB8PBI** 6.

DELTA DIVISION

ARKANSAS—SCM, Ulmon M. Goings, W5ZZY—SEC: K5CIR, PAM: DYL, RM: SZJ. We are glad to have BYJ back in the State. SZJ has been appointed RM to replace CAF, who has resigned. We want to encourage all of the c.w. operators to give Bill the best in participation and let's keep the traffic moving in Arkansas. K5MDZ is the owner of a brand-new General Class license, VQD now has a rig on 2 meters. The Jonesboro Club has 6 stations on 6 meters and has an active net on Sun. WSM has received his WAC certificate. A new Novice in Russellville is K5NPMB. KN5LNN is now General Class. KRO has a new 4-1000 rig. The club in Pine Bluff gained 5 new members in March but lost K5AQC and CTW, who have moved away. Our hats are off to the Pine Bluff Club for the interest shown in the Boy Scouts of that area. The Club in Walnut Ridge recently held its Dinner Social with a good turnout. The club reports one new Novice, KN5MIA. K5BGE has moved from Clarksville to West Plains, Mo. We are glad to see the increasing interest in the local nets. Traffic W5ZZJ 105, BYJ 56, K5IPS 27, W5ZWN/5 24, CEU 17 WSM 14, K5HOS 8, W5ENP 4, K5KAC 4, W5DYL 2.

LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—GIZ's auto license plate will be displayed at the Brussels International Exposition this summer. K5LKC is active in the Mississippi and Magnolia Emergency Nets and the Texas YL Roundup, is running a Command ARC/5. K5BLB should be on 420 Mc. now with 10 watts. The Central Louisiana Amateur Radio Club, sparked by K5EFS, has been reorganized. Officers are K5ISY, pres.; GKT, vice-pres.; K5EFS, secy.-treas.; K8BLB/5 act. mgr. A club station has been set up at the Menard Memorial High School. The group will hold a hamfest on Aug. 31. Prizes will include a 10-B exciter. An informal gathering was held at Natchitoches recently. Among those attending were K5HFI, at whose home the meeting was held, K5LND, K5PGW, V5MDR, DDR, SRM, TUZ, YNG, FMO, GNN, a visiting fireman who overheard some talk in the local hotel about a ham meeting, K5LXI, Dallas, Tex., and two unlicensed but willing prospects. The Lafayette Amateur Radio Club's new officers are VAQ, pres.; K5DPH, treas.; Don White, secy. CWC is operating 11-meter mobile. MXQ, who reports into RN3, MARS, LAN and CAN, says that the Louisiana C.W. Net is improving with new stations and sections of the State reporting in. The net operates at speeds of 5-25 w.p.m. K5AJG sends the ARRL Official Bulletins prior to the net roll call on 3615 kc. at 6:15 P.M. each day. K5DMA joined the ranks of grandfathers. Traffic: W5CEZ 281, MXQ 100, NDV 68, K5DMA 15, W5CWC 12.

MISSISSIPPI—SCM, John Adrian Houston, sr. W3EEHH—DWY reports a recent informal meeting and party at his QTH of v.h.f. operators from six mid-south cities—RCI, LPG, BSE, VQD, K5AEH, K5BIO and K5CPS to compare notes and tape recordings of Satellites Sputnik and Vanguard. All are members of the International Geophysical Year. K5MOP, Jessie James is the new voice of N.E. Miss. K5DXL is working 75-, 15- and 10-meter phone and says his bow-tie antenna is doing a fine job on 10 meters. FPI wishes you Mississippi operators would check with him on the Gulf Coast Hurricane Net any evening and help in getting a Mississippi c.w. net going. Sgt. Geo. Paynter GUU, and 3CYX/5 were visitors at the last meeting of the Cleveland Amateur Radio Club. Sgt. Paynter gave a talk on AF MARS and signed up several new members. The MME Net has 55 active members; 60 pieces of formal traffic were handled on the net this month. Appointments: KAEWX as OO, K5HQ as EC, W5WZB as ORS, Traffic: W5FPI 452, TIR 68, JHS 68, RIM 56, K5DFD, 17, IHO 15, MEFY 14, AYP 12.

(Continued on page 120)

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Special! FT-243 Prec. Calib. to 1st Decimal

2 Meters { Exam: *8010.6 x 10=144.190

Exam: *8010 x 10=144.180

Note—10 KC difference between the above

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2000	2000	4900	5072	5120	5172	5230	5280	5330	5380	5430	5480	5530	5580	5630	5680	5730	5780	5830	5880	5930	5980	6030
2010	2010	4950	5075	5125	5175	5235	5285	5335	5385	5435	5485	5535	5585	5635	5685	5735	5785	5835	5885	5935	5985	6035
2015	2015	4950	5080	5130	5180	5240	5290	5340	5390	5440	5490	5540	5590	5640	5690	5740	5790	5840	5890	5940	5990	6040
2020	2020	4990	5090	5140	5190	5250	5300	5350	5400	5450	5500	5550	5600	5650	5700	5750	5800	5850	5900	5950	6000	6050
2025	2025	5030	5100	5170	5240	5310	5380	5450	5520	5590	5660	5730	5800	5870	5940	5970	6040	6110	6180	6250	6320	6390
2030	2030	5070	5150	5230	5310	5390	5470	5550	5630	5710	5790	5870	5950	6030	6110	6190	6270	6350	6430	6510	6590	6670
2035	2035	5110	5200	5290	5380	5470	5560	5650	5740	5830	5920	6010	6100	6190	6280	6370	6460	6550	6640	6730	6820	6910
2040	2040	5150	5250	5350	5450	5550	5650	5750	5850	5950	6050	6150	6250	6350	6450	6550	6650	6750	6850	6950	7050	7150
2045	2045	5190	5300	5410	5520	5630	5750	5870	5990	6110	6230	6350	6470	6590	6710	6830	6950	7070	7190	7310	7430	7550
2050	2050	5230	5350	5470	5600	5730	5870	6010	6150	6290	6430	6570	6710	6850	6990	7130	7270	7410	7550	7690	7830	7970
2055	2055	5270	5400	5530	5670	5810	5960	6110	6260	6410	6560	6710	6860	7010	7160	7310	7460	7610	7760	7910	8060	8210
2060	2060	5310	5450	5590	5730	5870	6020	6180	6340	6500	6660	6820	6980	7140	7300	7460	7620	7780	7940	8100	8260	8420
2065	2065	5350	5500	5650	5810	5970	6130	6300	6470	6640	6810	6980	7150	7320	7500	7680	7860	8040	8220	8400	8580	8760
2070	2070	5390	5550	5710	5870	6040	6210	6380	6550	6720	6900	7080	7260	7440	7620	7800	8000	8180	8360	8540	8720	8900
2075	2075	5430	5600	5770	5940	6120	6300	6480	6660	6840	7020	7200	7380	7560	7740	7920	8100	8280	8460	8640	8820	9000
2080	2080	5470	5650	5830	6010	6200	6380	6560	6750	6940	7130	7320	7510	7700	7890	8080	8270	8460	8650	8840	9030	9220
2085	2085	5510	5700	5890	6080	6270	6460	6650	6840	7030	7220	7410	7600	7790	7980	8170	8360	8550	8740	8930	9120	9310
2090	2090	5550	5750	5950	6150	6350	6550	6750	6950	7150	7350	7550	7750	7950	8150	8350	8550	8750	8950	9150	9350	9550
2095	2095	5590	5800	6010	6220	6430	6640	6860	7080	7300	7520	7750	7980	8210	8440	8670	8900	9130	9360	9600	9830	10050
2100	2100	5630	5850	6070	6300	6530	6760	6990	7220	7450	7680	7910	8140	8370	8600	8830	9060	9300	9530	9760	9990	10220
2105	2105	5670	5900	6130	6360	6600	6840	7080	7320	7560	7800	8040	8280	8520	8760	9000	9240	9480	9720	9960	10200	10440
2110	2110	5710	5950	6190	6430	6670	6920	7170	7420	7670	7920	8170	8420	8670	8920	9170	9420	9670	9920	10170	10420	10660
2115	2115	5750	6000	6250	6500	6760	7020	7280	7550	7820	8100	8380	8660	8940	9220	9500	9780	10060	10340	10620	10900	11180
2120	2120	5790	6050	6320	6600	6870	7140	7420	7710	8000	8300	8600	8900	9200	9500	9800	10100	10400	10700	11000	11300	11600
2125	2125	5830	6100	6390	6680	6970	7260	7560	7870	8180	8490	8800	9110	9420	9730	10040	10350	10660	10970	11280	11590	11900
2130	2130	5870	6170	6470	6780	7090	7410	7740	8080	8430	8780	9140	9500	9860	10220	10580	10940	11300	11660	12020	12380	12740
2135	2135	5910	6220	6530	6850	7170	7500	7840	8190	8550	8920	9290	9660	10030	10400	10770	11140	11510	11880	12250	12620	13000
2140	2140	5950	6250	6570	6900	7230	7560	7900	8240	8600	8960	9330	9700	10070	10440	10810	11180	11550	11920	12290	12660	13030
2145	2145	6000	6300	6620	6950	7280	7620	8000	8340	8700	9060	9430	9800	10170	10540	10910	11280	11650	12020	12390	12760	13130
2150	2150	6040	6350	6670	7000	7330	7670	8030	8390	8750	9120	9490	9860	10230	10600	10970	11340	11710	12080	12450	12820	13190
2155	2155	6080	6400	6720	7040	7370	7700	8060	8420	8780	9150	9520	9890	10260	10630	11000	11370	11740	12110	12480	12850	13220
2160	2160	6120	6430	6750	7070	7400	7730	8100	8470	8840	9210	9580	9950	10320	10690	11060	11430	11800	12170	12540	12910	13280
2165	2165	6160	6460	6780	7100	7430	7760	8130	8500	8870	9240	9610	9980	10350	10720	11090	11460	11830	12200	12570	12940	13310
2170	2170	6200	6520	6840	7160	7500	7830	8200	8570	8940	9310	9680	10050	10420	10790	11160	11530	11900	12270	12640	13010	13380
2175	2175	6240	6560	6870	7180	7510	7840	8210	8580	8950	9320	9690	10060	10430	10800	11170	11540	11910	12280	12650	13020	13390
2180	2180	6280	6600	6920	7240	7570	7900	8270	8640	9010	9380	9750	10120	10490	10860	11230	11600	11970	12340	12710	13080	13450
2185	2185	6320	6630	6950	7260	7590	7920	8290	8660	9030	9400	9770	10140	10510	10880	11250	11620	11990	12360	12730	13100	13470
2190	2190	6360	6660	6980	7300	7630	7960	8330	8700	9070	9440	9810	10180	10550	10920	11290	11660	12030	12400	12770	13140	13510
2195	2195	6400	6710	7020	7330	7640	7970	8340	8710	9080	9450	9820	10190	10560	10930	11300	11670	12040	12410	12780	13150	13520
2200	2200	6440	6730	7030	7340	7650	7980	8350	8720	9090	9460	9830	10200	10570	10940	11310	11680	12050	12420	12790	13160	13530
2205	2205	6480	6770	7070	7370	7670	8000	8370	8740	9110	9480	9850	10220	10590	10960	11330	11700	12070	12440	12810	13180	13550
2210	2210	6520	6810	7100	7400	7700	8000	8370	8740	9110	9480	9850	10220	10590	10960	11330	11700	12070	12440	12810	13180	13550
2215	2215	6560	6860	7160	7460	7760	8060	8430	8800	9170	9540	9910	10280	10650	11020	11390	11760	12130	12500	12870	13240	13610
2220	2220	6600	6900	7200	7500	7800	8100	8470	8840	9210	9580	9950	10320	10690	11060	11430	11800	12170	12540	12910	13280	13650
2225	2225	6640	6940	7240	7540	7840	8140	8510	8880	9250	9620	9990	10360	10730	11100	11470	11840	12210	12580	12950	13320	13690
2230	2230	6680	6980	7300	7600	7900	8200	8570	8940	9310	9680	10050	10420	10790	11160	11530	11900	12270	12640	13010	13380	13750
2235	2235	6720	7020	7320	7620	7920	8220	8590	8960	9330	9700	10070	10440	10810	11180	11550	11920	12290	12660	13030	13400	13770
2240	2240	6760	7060	7360	7660	7960	8260	8630	9000	9370	9740	10110	10480	10850	11220	11590	11960	12330	12700	13070	13440	13810
2245	2245	6800	7100</																			





Dominate your
frequency with 2000 watts*



**VIKING "PACEMAKER"
TRANSMITTER/EXCITER**

This exciting transmitter offers you the ultimate in single sideband . . . 90 watts SSB P.E.P. and CW input . . . 35 watts AM. Self-contained—effectively TVI suppressed. Instant bandswitching 80, 40, 20, 15, and 10 meters. Excellent stability and suppression. Temperature compensated built-in VFO . . . separate crystal control provided for each band. VOX and anti-trip circuits provide excellent voice controlled operation. Pi-network output matches antenna loads from 50 to 600 ohms. More than enough power to drive the Viking "Kilowatt" or grounded-grid kilowatt amplifiers. (Requires Cat. No. 250-34 Power Divider with Viking "Kilowatt".) With tubes and crystals, less key and microphone.

Cat. No. Amateur Net
240-301-2. Wired and tested. \$495.00

VIKING "KILOWATT" AMPLIFIER

In a class by itself . . . the ultimate in contemporary transmitter design! The Viking "Kilowatt" is the only transmitter available that provides full, maximum legal power in all modes—SSB, CW, and AM. Class C final amplifier operation provides plate circuit efficiencies in excess of 70% with unequalled broadcast-type high level amplitude modulation. A pair of 4-400A tubes in Class AB₂ easily deliver 2000 watts P.E.P.* in SSB mode—provides a full 1000 watts input in AM mode with a pair of push-pull Type 610 tubes in Class B modulator service. 1000 watts input in Class C CW mode. High efficiency pi-network output circuit will match 50 to 500 ohm antenna loads.

Compact pedestal contains the complete kilowatt—rolls out for easy adjustment or maintenance. Excitation requirements: 30 watts RF and 10 watts audio for AM; 2-3 watts peak for SSB. With tubes.

Cat. No. 240-1000. . Wired and tested. Amateur Net \$1595.00

Matching accessory desk top, back and three-drawer pedestal

Cat. No. 251-101-1..... FOB Corry, Pa. \$132.00

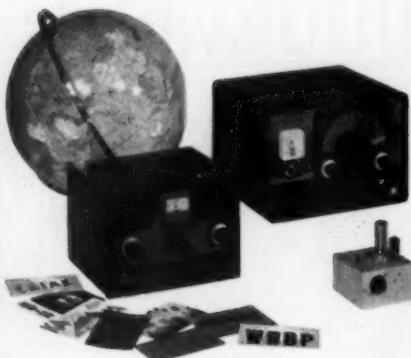
*The F.C.C. permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.



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Your best buy!

Johnson Amateur Equipment



VIKING "NAVIGATOR" TRANSMITTER/EXCITER

This flexible CW transmitter/exciter has enough RF power to excite most high powered amplifiers on CW and AM. 40 watts input — 6146 final amplifier tube. Bandswitching 160 through 10 meters. Built-in VFO or crystal control—TVI suppressed—timed sequence keying. Pi-network output will match 40 to 600 ohm loads. With tubes and self-contained power supply, less crystals and key.

Cat. No. 240-126-1, Kit Amateur Net \$149.50
 Cat. No. 240-126-2, Wired and tested Amateur Net \$199.50

VIKING "ADVENTURER" TRANSMITTER

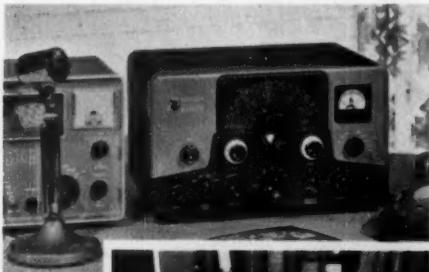
This completely self-contained 50 watt CW transmitter was used to earn the first novice WAC! (Worked All Continents) Instant bandswitching 80 through 10 meters . . . operates by crystal or external VFO control. Rugged 807 transmitting tube—wide range pi-network output—TVI suppressed—timed sequence keying. Easy to assemble—complete with tubes, less crystals and key.

Cat. No. 240-181-1, Kit Amateur Net \$54.95

SPEECH AMPLIFIER/SCREEN MODULATOR—Designed to provide phone operation for the "Adventurer". High gain—use with crystal or dynamic microphones. Simple installation. With tubes.

Cat. No. 250-40, Kit Amateur Net \$12.25

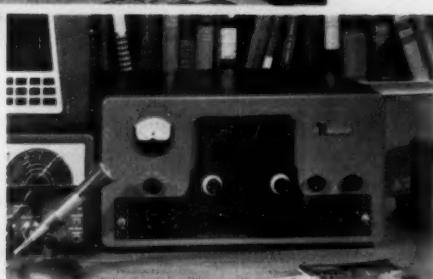
Pick your power...choose your features



VIKING "RANGER" TRANSMITTER/EXCITER

This popular 75 watt CW or 65 watt phone transmitter will also serve as an RF and audio exciter for high power equipment. Completely self-contained . . . TVI suppressed . . . instant bandswitching 160 through 10 meters. Extremely stable built-in VFO or crystal control. Final amplifier tube is a 6146. Easy to assemble—with tubes, less crystals, key and microphone.

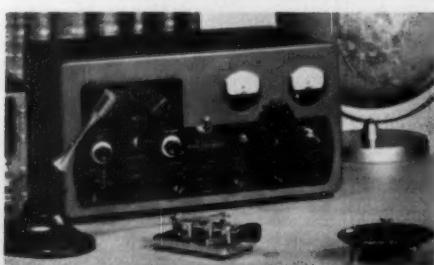
Cat. No. 240-161-1, Kit Amateur Net \$229.50
 Cat. No. 240-161-2, Wired and tested Amateur Net \$329.50



VIKING "VALIANT" TRANSMITTER

Here is power to slice through terrific QRM! 275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) and 200 watts phone. Instant bandswitching 160 through 10 meters—operates by built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms . . . final amplifier utilizes three 6146 tubes in parallel. TVI suppressed—timed sequence keying—low level audio clipping—built-in low pass audio filter—self-contained power supplies. Complete with tubes, less crystals, key and microphone.

Cat. No. 240-104-1, Kit \$349.50
 240-104-2, Wired and tested \$439.50



VIKING "FIVE HUNDRED" TRANSMITTER

Rated a full 600 watts CW . . . 500 watts phone and SSB. (P.E.P. with auxiliary SSB exciter.) Compact RF unit designed for desk-top operation—power supply/modulator unit may be placed in any convenient location. All exciter stages ganged to VFO tuning—also may be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system—low level audio clipping. Final amplifier uses a 4-400A high efficiency tetrode. Pi-network output will match a wide range of antenna impedances. Complete with tubes, less crystals, key and microphone.

Cat. No. 240-500-1, Kit Amateur Net \$749.50
 Cat. No. 240-500-2, Wired and tested Amateur Net \$949.50

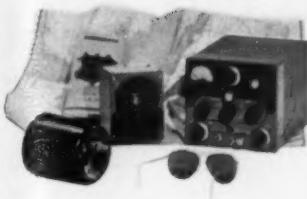
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VIKING "MOBILE" TRANSMITTER

Rated at 60 watts PA input—powerful PP807 modulator provides extra audio punch! Instant bandswitching 75 through 10 meters. All stages ganged to a single tuning knob. Under-dash mounting. Specify 6 or 12 volts. Less tubes, crystals, microphone and power supply.

Cat. No. 240-141-1 . Kit Amateur Net \$107.00
Cat. No. 240-141-2 Wired and tested on special order only.

MOBILE VFO—Small size—rugged construction. Temperature compensated and voltage regulated. Calibrated 75 through 10. With tubes.

Cat. No. 240-152-1 . Kit Amateur Net \$33.95
Cat. No. 240-152-2 Wired and tested Amateur Net \$32.50

"WHIPLOAD-6"—High efficiency base loading for mobile whips. Bandswitching 75 through 10 meters. High "Q". Fibre-glass housing.

Cat. No. 250-26 Wired and tested Amateur Net \$16.95

for VHF... VIKING "6N2" TRANSMITTER

Rated at 150 watts CW and 100 watts phone—bandswitching 6 and 2 meters! TVI suppressed—may be used with Viking I, II, "Ranger" or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals, key and microphone.

Cat. No. 240-201-1 . Kit Amateur Net \$129.50
Cat. No. 240-201-2 Wired and tested Amateur Net \$169.50

TWO METER VFO—Replaces 8 mc. crystals in most two meter equipment. Temperature compensated—excellent stability. Output range: 7.995 mc. to 8.235 mc. Lucite dial calibrated 144 to 148 mc. Requires 6.3 volts at .3 amp. and 27-0-325 volts at 10 ma. With tubes and power cable.

Cat. No. 240-132-1 . Kit Amateur Net \$29.50
Cat. No. 240-132-2 Wired and tested Amateur Net \$46.50



2 exciting desk-top linear amplifiers...

VIKING "COURIER" AMPLIFIER

Rated at solid 500 watts P.E.P. input with auxiliary SSB exciter as a Class B linear amplifier; 500 watts CW or 200 watts AM linear. Self-contained desk-top package—may be driven by the Viking "Navigator", "Ranger", "Pacemaker" or other unit of comparable output. Continuous coverage 3.5 to 30 mcs. Drive requirements: 3 to 35 watts depending on mode and frequency desired. Employ two 811A triodes in parallel. Pi-network output will match 40 to 600 ohm loads. TVI suppressed. With tubes and built-in power supply.

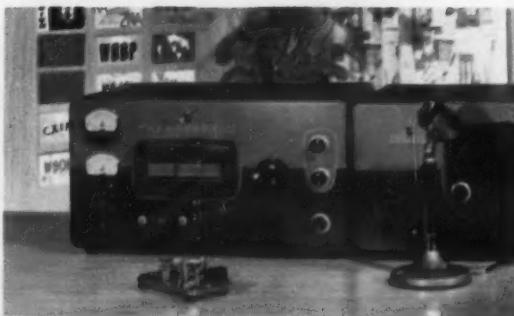
Cat. No. 240-352-1 . Kit Amateur Net \$244.50
Cat. No. 240-352-2 Wired and tested Amateur Net \$289.50



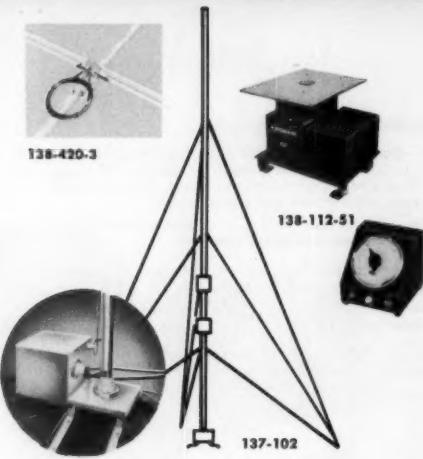
VIKING "THUNDERBOLT" AMPLIFIER

The hottest linear amplifier on the market—engineered to provide maximum "talk-power" to smash through QRM. 2000 watts P.E.P. *input SSB; 1000 watts CW; 800 watts AM linear; in a completely self-contained desk-top package. Delivers a dominant signal on all amateur bands—continuous coverage 3.5 to 30 mcs.—instant bandswitching. May be driven by the Viking "Navigator", "Ranger", "Pacemaker" or other unit of comparable output. Drive requirements: approx. 10 watts in Class AB₂ linear; 20 watts Class C continuous wave. Final amplifier employs two 4-400A tetrodes in parallel, bridge neutralized. Complete with tubes and built-in power supply.

Cat. No. 240-353-1 . Kit Amateur Net \$524.50
Cat. No. 240-353-2 Wired and tested Amateur Net \$589.50



*The F.C.C. permits a maximum of one kilowatt average power input for the amateur service. In SSB operation under normal conditions this results in peak envelope power inputs of 2000 watts or more depending upon individual voice characteristics.



Station Accessories...

VIKING "MATCHBOXES"—Self-contained, bandswitching 80 through 10 meters. Provides integrated antenna matching and switching. Tunes out large amounts of reactance. No load-tapping or plug-in coils necessary.

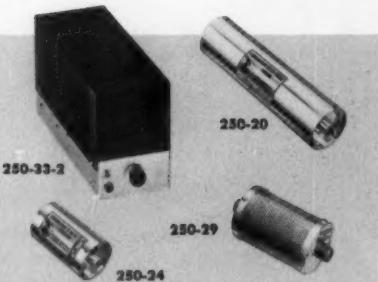
Cat. No. 250-23 .275 watts, wired..... Amateur Net \$ 54.95
 Cat. No. 250-30 . Kilowatt, wired..... Amateur Net \$124.50

DIRECTIONAL COUPLER AND INDICATOR—Provides continuous reading of SWR and relative power in transmission line. Coupler may be permanently installed in 52 ohm coaxial line—handles maximum legal power specified by FCC. The Indicator is a 0-100 microammeter calibrated in SWR and relative power.

Cat. No. 250-37 . Coupler..... Amateur Net \$11.75
 Cat. No. 250-38 . Indicator..... Amateur Net \$25.00

T-R SWITCH—Provides instantaneous break-in on SSB, DSB, CW or AM. Excellent receiver isolation. Gain: 2 db at 30 mcs.; 6 db at 3.5 mcs. Rated at 4000 watts peak power. With tube, power supply and provision for RF probe.

Cat. No. 250-39 . Wired..... Amateur Net \$27.75



CRYSTAL CALIBRATOR—Provides accurate 100 kc check points to 55 mc. Requires 6.3 volts at .15 amps and 150-300 volts at 2 ma. With tube and crystal.

Cat. No. 250-28 . Wired and tested..... Amateur Net \$17.95

"SIGNAL SENTRY"—Monitors CW or phone signals up to 50 mc. Powered by receiver. With tubes.

Cat. No. 250-25 . Wired and tested..... Amateur Net \$22.00

KEYS AND PRACTICE SETS—See your distributor or write for descriptive literature on Johnson's complete key line.

The E. F. Johnson Co. reserves the right to change prices or specifications without notice and without incurring obligation.

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Antennas, Beams and Rotators...

PRE-TUNED BEAMS—Rugged, semi-wide spaced with balun matching sections. Approximately 9.0 db gain over tuned dipole—more than 27 db front-to-back ratio with low SWR. With 3 elements, boom and balun.

Cat. No. 138-420-3 . 20 Meters..... Amateur Net \$139.00
 Cat. No. 138-415-3 . 15 Meters..... Amateur Net \$110.00
 Cat. No. 138-410-3 . 10 Meters..... Amateur Net \$ 79.50

"ROTOMATIC" ROTATOR—Supports beam antennas weighing up to 175 pounds. Rotates 1/4 RPM—over all gear reduction, 1200 to 1. Housing is cast aluminum with 5/16" steel rotating table. Hinged to tilt 90°. With desk-top control box.

Cat. No. 138-112-51 . With limit switches for 370° rotation for coaxial line..... Amateur Net \$354.00

"MATCHSTICK"—Fully automatic, pre-tuned multi-band vertical antenna system. Bandswitching 80 through 10 meters. Remotely motor driven from operating position. Easily mounts on roof top or in limited space location. Low SWR (less than 2 to 1) all bands. Impedance: 52 ohms. With 35' mast, base, tuning network, relays, control box and Dacron guy lines.

Cat. No. 137-102 . Pre-tuned..... Amateur Net \$129.50



VIKING AUDIO AMPLIFIER—Self-contained 10 watt speech amplifier, complete with power supply and tubes. Speech clipping and filtering improves performance and effectiveness of your AM transmitter.

Cat. No. 250-33-1 . Kit..... Amateur Net \$73.00
 Cat. No. 250-33-2 . Wired and tested..... Amateur Net \$99.00

LOW PASS FILTER—Handles more than 1000 watts RF. 75 db or more attenuation above 54 mc. Wired and pre-tuned.

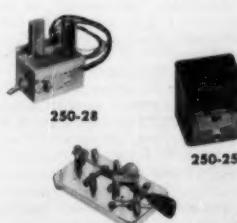
Cat. No. 250-20 . 52 Ohms Impedance..... Amateur Net \$14.95
 Cat. No. 250-35 . 72 Ohms Impedance..... Amateur Net \$14.95

SWR BRIDGE—Provides accurate measurement of SWR for effective use of low pass filter and antenna coupler.

Cat. No. 250-24 . 52 Ohms Impedance..... Amateur Net \$9.75

POWER REDUCER—Provides up to 20 watts continuous dissipation, permitting 100-150 watt transmitters such as Johnson Viking, Collins 32V to serve as excitors for the Viking "Kilowatt". Completely shielded.

Cat. No. 250-29..... Amateur Net \$13.95



E. F. Johnson Company

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Wire one of these Universal Receiver or Transceiver Power Supplies directly to your battery and mobile equipment and it will begin to pay for itself immediately.

By replacing the dynamotor or vibrator, transformer, rectifier and filter with one compact, lightweight, troublefree unit it repays its cost in economical operation, long life, and lowered repair and replacement bills.

You will be operating the same quality power supply manufactured by Universal for military and commercial communications equipment and other electronic systems where proved reliability is important. It contains no moving parts. There is NO arcing. Your mobile equipment is not modern without a Universal Power Supply!

EXTREMELY LOW RIPPLE

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Transceiver Supplies—
(Rated for continuous duty with
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450v DC @ 255ma	450v DC @ 255ma
250v DC @ 160ma	OR 250v DC @ 150ma
	—55v DC @ 10ma

(2½ lbs.—3¾" x 5¾" x 3¾")



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Machlett coaxial triodes are available for transmitters or induction or dielectric heaters 3kw to 50kw and higher.

You will realize gains in tube life as well as significantly lower operating costs.

Write today for information on converting to...

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meter operation soon. The Niles ARC members were hosts to seventy hams from the Michigan Area at their annual dinner meeting. There was an excellent program on the subject of antennas by CVQ and EYD. All present enjoyed their eye-opening demonstration which employed sweep methods for displaying the effects of antenna and feeder adjustments using convenient v.h.f. equipment. Traffic: (Mar.) W8AWGU 508, K8NAW 122, W8LP 115, NOH 105, YAN 82, GKT 79, FWQ 78, FX 73, RTN 60, DAP 64, OCC 57, TBP 40, K8AXL 34, ADD 31, CKD 31, W8FDO 24, VVG 21, AUD 19, QIX 18, RAE 17, SCW 17, JXK 16, OGY 16, WVL 15, HKT 14, IZS 13, SWN 11, DSE 8, RJC 8, QOI 6, SJF 6, TIC 6, WXO 6, FSZ 4, UCN 2. (Feb.) W8GKT 81, NUL 20, K8AXL 32, W8RVZ 28, FSZ 5.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE. SEC: UPB. RM: DAE. PAMs: HPP, HUX and HZJ. Thanks for reflecting me as SCM. Greater Cincinnati ARA's 1938 officers are SMQ, pres.; QBJ, vice-pres.; WJV, 2nd vice-pres.; LPC, rec. secy.; IVE, corr. secy.; and NCV, treas. KN8JIO is a new ham in Zanesville. KN8IBE and K8CKV are a father-son team. The stork brought baby boys to QLJ and UNE. UPH handled over 1000 messages in February. He also made WAS. OUU is at Ohio State. TZO and K8BOF gave themselves an HQ-110 for their 16th wedding anniversary and TZO received a VA-JF. Dayton ARA's *R-F Carrier* reports that HAF is in the hospital and the v.h.f. group elected TEK, pres.; GHX, vice-pres.; and K8IYW, secy.-treas. The Fusco RC reports that MEI, GAC, WFE and LVW form its TVI committee. SBM has a new 10-meter beam and BIM, BRN, EUK, FMW, FSM, GAB, GAC, GUP, HQ, IKM, JHJ, LVW, MEI, MVX, NCF, NQR, NVQ, OYV, QXH, RAS, RNL, RQO, SBM, STR, TAZ, TDB, TND, TTJ, WFJ, WSH, WTQ, ISCY, 3NBR, 3PON, 6FGJ, 6FLW, K6DQA, K6EXQ and KZJJ have been issued Knucklehead Net certificates. ARC's Q-5 tells us that K8AOH repeats construction and operation of a 220-Mc. transmitter-receiver. LVH made WAS and K8BPY dropped the "N." WE's father passed on. DRW and K8HMJ have their General Class tickets. KN8JB is a new ham in Steubenville. The Jefferson County AREC relayed messages during the "Cerebral Palsy Telecast" with DNR, DRW, ERR, EZC, FRV, MKT, ZRI, K8s BYF, DQG, DTO, HMJ, IGO and KN8JJB taking part in Steubenville and AXR, BLP, RZ, UJU, VYB, WIF, WSY, K8s ANU, EPR and HGY in East Liverpool. The Cuyahoga County AREC helped the Easter Seal drive by using mobiles to pick up the money from various parts of the county. Those who took part were AEU, BAH, BHR, LFY, LHX, MVU, NRI, PVC, SQU, TFW, TTF, TTR, K8s AAP, BWH, CWW, DPA, ETF, GHW, IHC and JGH. CTZ and SQU provided valuable assistance to the Standard Oil Research Laboratory, which is tracking the satellites. K8HHV won the Halliecricket s.s.b. contest and received a SX-101 receiver. ARO is moving out West. HXB worked WAS on mobile. We wish to thank the Ohio Valley ARA for putting K8CAF on the air and giving us Navassa Island. KN8s JIC and JIE are new hams in Bay Village. The Piqua RC's 1938 officers are JIE, pres.; and TTU, secy.-treas. THJ is back from Florida. BZX is working DX. Toledo's *Shack Gossip* informs that the "Ham of the Month" is VKR; IAA, one of its editors, is moving from Toledo and VJO will fill her shoes; K8EUC has a new Ranger; CFN has a new DX-100; GES spent four weeks in Florida; K8GOT dropped the "N"; and winners of hidden transmitter hunts were HYE on 10, K8DHL on 160 and K8DPE on 6 meters. The Ohio Phone Net is a growing traffic-handling net and needs more outlets in parts of the State. During March 199 messages were cleared. GFE and K8BPX made BPL. The Fulton County ARC demonstrated ham radio to the local Boy Scouts. New appointments: VKR, K8s ABI and DFN as ECs. Traffic: (Mar.) W8UPH 1073, K8BPX 510, W8SSU 270, GFE 214, DAE 103, K8DDG 93, W8QJ 74, IBX 60, HXB 52, AL 42, VYU 41, K8CCZ 30, W8HZJ 30, NNX 30, ARO 29, K8HFX 27, W8YGR 27, DSQ 24, STR 24, WYU 24, K8BIZ 20, CTQ 20, W8GQD 18, WTO 16, K8EVT 12, W8FFK 11, K8AAG 10, W8LT 10, RO 10, MXO 9, MGC 5, LGR 4, LLY 4, SMW 2, STF 2, CQP 1, EEE 1, (Feb.) K8BIZ 25, W8RO 1.

HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: KGC. RM: PHX. PAMs: IJG and NOC. Section nets: NYS on 3615 kc. at 1900, NYSPTEN on 3925 kc. at 1800, ESS on 3590 kc. at 1800, E.N.Y. AREC Net on 145.35 Mc. Fri. at 2100, MHT (Novice) on 3716 kc. Sat. at 1300, K2UTL, operating K4WBG at Ft. Knox, sends greetings to his E.N.Y. friends. SGZ, EOM and K2LQI spoke on the E.N.Y. Medical (Continued on page 124)



FIRST AGAIN WITH
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Now... a complete high performance 10-meter station
... transmitter, receiver, power supply... "packaged"
for the big result, the big value.

Complete! Connect antenna, mike and AC power—operate—in a big way.
transmitter... The husky 50 watt transmitter uses Type 6146 tube, has pi network output. Multiplier stages are ganged and tracked with highly stable, calibrated VFO. (Crystal control is optional.) VFO spotting switch facilitates "zeroing in" on desired stations. Panel meter is switchable to read amplifier grid or plate currents or modulator plate current.

receiver... The sensitive, selective 10-meter communications receiver utilizes double-conversion, also features adjustable "squench" for muted standby, an effective noise limiter, "S" meter, panel-mounted loudspeaker. Coverage is 28-29.7 mcs. Dial is full-vision, has planetary vernier drive for easy tuning.

power supply... Heavy-duty 115 volt AC power supply is built-in.

A single compact housing... Everything in a single compact housing... an area less than one square foot. 13" wide, 7½" high, 12½" deep. Cabinet and panel are finished in Alpine White, complemented with Gun Metal Blue knobs. Attractive... functional.

A big value! A "package" with every modern feature at a selling price that is unusually low.

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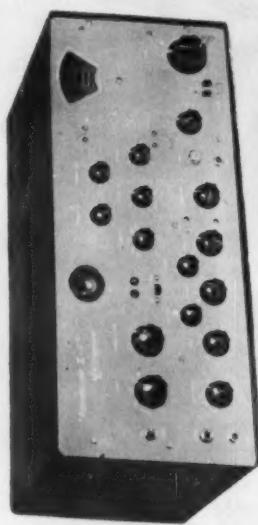
SSB or DSB suppressed carrier or with carrier, PAM and CW.

6146 power amplifier delivers 65 PEP watts output, giving sufficient power to drive nearly all types of linear amplifiers INCLUDING grounded grid finals.

Calibrate control allows variable control of signal for zero beacling VFO to receiver frequency or TOF (talk on frequency.)

Voltage Regulation of 6146 Screen and 9MC OSC. Temperature compensating condensers in critical 9MC circuit for improved stability.

Built in 3500 cps low pass audio filter.



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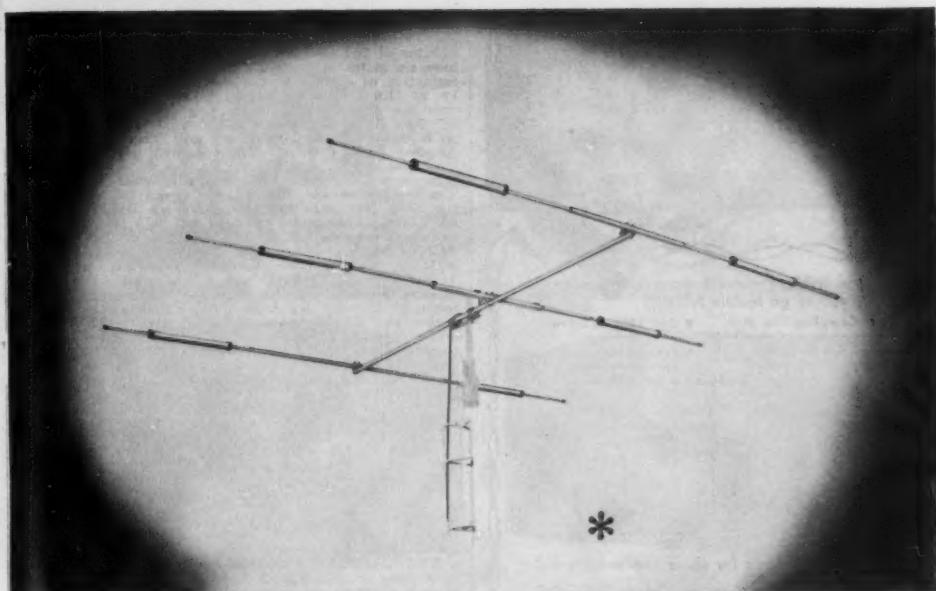
MANUFACTURERS OF PRECISION ELECTRONIC EQUIPMENT

Net at the Albany Club on Mar. 23. Welcome to KN2LLA in Hillside with a Globe Chief and an S-35. LCB reports WAS was made in three weeks on 40-meter c.w. Appointment: K2ZMH as Columbia Co. EC. Endorsement: TYC as ORS. The section AREC Net reports an average of 15 stations on its weekly drills. K2QIX picked up Explorer II six minutes after launching before the satellite was in orbit. A total of 20 states on 2 meters is reported by LWI. The bad March WX was hard on antennas, including the beams at DIN. Interference—its causes, cures and public approach, featured the April meeting of the Schenectady Club. K2HPQ has been instructing General Class candidates in Albany. Congrats to K2YTD on another BPL card. Unless new members QNI, the manager is considering closing the MHT Net. How about it, Novices? A written disaster emergency plan was formulated by EC WWK of Schenectady Co. Any section EC can receive a copy upon request to WWK. Lighthouse Larry, JZK, was speaker at the Elmira Hamfest in March. Traffic: (Mar.) K2HPQ 387 YTD 221, LKI 174, VTFW 146, W2ATA 129, K2YJL 102, UTV 70, W2EFU 62, K2HNW 40, W2SZ 38, K2HJX 36, PXM 26, W2LWI 21, K2CRG 17, KN2DSC 16, W2ERO 8.

NEW YORK CITY AND LONG ISLAND—SCM, Harry J. Dannals, W2TUK—SEC: ADO, RM: WFL, PAM: OBW, V.H.F. PAM: K2EQH, Section Nets: N.I. on 3630 kc, nightly at 1930 EDST and Sat. at 1915 EDST; NYC-LIPN, on 3908 kc, Mon. through Sat. from 1730 to 1830 EDST; NYC-LI AREC, on 3908 kc, Sun. at 0900 EDST; U.H.F. Traffic Net, on 145.8 Mc. Wed. at 2000 EDST. Please note the change in time for the Sunday AREC Net. BPL cards go to KEB and VDT and VDT received his BPL Medallion. Once again the request goes out for stations in the N.Y.C. area. Messages for the Metropolitan Area must be mailed because of a lack of stations to accept the traffic. Can you help? K2VUI needs only two states to complete his WAS. K2SSE worked all Delaware counties. K2DQC dropped the "N." K2RKL is looking for more stations on 432 Mc. PZE installed a new t.r. switch. Ex-ELT is now K4UAP in Florida. A new 4-400A linear amplifier is in use at HQL. K2FC plays chess with USBSKBR via radio. LCF has his 420-Mc. receiver working. John sends ARRL Official Bulletins on 6-meter m.e.w., followed by voice for checking. This is good code practice for the Tech. Class licensees on 50 Mc. DTL logged a visit from CE5DT. PRB is mobiling with his new KWM-1. WN2TNP is operating on 15 and 40 meters. A new SX-101 is in use at KN2VLT. WMG is using a new CD-HAM rotator. K2OEG needs only two more states to complete his WAS. More than 20 mobiles participated in a recent 6-meter hidden transmitter hunt. These hunts and those conducted on 2 and 10 meters have met with great success throughout the section. New stations on 50 Mc. are K2s IYZ, OBM, PEE, RBS and UCK. K2USL joined the 6 meter mobileers. TWZ, a cliff-dweller, is active on 50 Mc. A new DX-100 is now in operation at K2MEM. HQN received his 25-w.p.m. Code Proficiency endorsement. K2UAQ is enjoying the DX openings on 10 meters. Ex-MIX now signs K4RFF in Florida. OI is in W6-Land and looks forward to contacts with the NYC-LI gang on 10 and 15 meters. Ex-JBP now signs K6MTX. BVB, YBT's XYL, dropped the "N." K2TMJ is mobile with an Elmac, KNA, EC and RO for Suffolk County, reports renewal of the RACES license. K2BGP, [New officers of the South Side RC are K2TBU, pres.; K2UZB, vice-pres.; K2LBB, secy.-treas.; and K2KAT, club advisor. K2TBU received his WAS certificate. JEG and K2YKQ dropped the "N." MZN is mobile on 10 meters. K2KUM is a proud grandpa. K2VWF has a new Babcock rig. K2TPU passed his Tech. Class exam. New officers of the Eastern Suffolk RC are K2OQC, pres.; K2EC, vice-pres.; K2UEK, secy.; and KDN, treas. K2PFH has Gonsset II, v.f.o. and linear on 144 Mc. GG's son and your SCM's brother, SZRA, passed his General Class exam and operates from Fort Worth with an SX-101 and an HT-32. Best wishes for a successful Field Day to our section's clubs and groups. BCNU from YKQ/2. Traffic: (Mar.) W2KEB 3450, VDT 525, JOA 382, OME 322, K2PHF 190, W2DSC 121, BO 103, LDQ 60, CKQ 59, CSO 59, K2RJO 48, BH 47, RKL 33, SEK 28, W2JBQ 21, UGF 18, K2VU 17, VIX 16, DDC 14, W2OBW 13, GP 12, K2SSE 11, W2DUS 10, IAG 10, EC 9, HQN 9, PZE 9, IN 8, PF 7, TUK 7, YBT 7, IVS 5, JCA 5, K2EQH 4, W2JGV 4, K2LUM 4, AAW 3, W2MDM 2, K2MEM 2, DEM 1, IRS 1, (Feb.) W2DSC 24, K2DDC 12, VIX 4.

NORTHERN NEW JERSEY—SCM, Lloyd H. Manamon, W2VQR—SEC: IIN, PAM: VDE, V.H.F. PAM: K2KVR, RMs: BRC, CGG and NKD. K2JLN recently made a 900-mile hop to Illinois on 230 Mc. K2JLN reports hearing Norway on 30.5 and 31.5 Mc. at 2300-0002 EST. K2OAM was elected asst. alternate

(Continued on page 126)



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Model TA-32

Similar to Model TA-33, but has 2 elements operating on 10, 15 and 20 meters. Forward gain is 5.5db, front-to-back is 20db and SWR is 1.5/1. Featuring a short boom of just 7 ft. and max. element length of 28 ft. Weight is 34 lbs. Converts to Model TA-33.

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This low cost, high performance vertical antenna covers all bands from 10 thru 40 meters. Requires little space and may be mounted on ground or roof-top. Low SWR and band switching is automatic. Loading coil available for 80 M.

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AF-67 TRANSCITER

AF-67 TRANSCITER — Serves as exciter, speech amplifier, VFO, driver or a complete low powered transmitter. 7 amateur bands — 160 through 10 meters — single-knob bandswitching. Built-in VFO. Operates from 6 to 12 volt DC source . . . \$17.70 down . . . \$9.64 a month for 18 months.

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PMR-7 RECEIVER — Complete 10 tube, dual conversion mobile receiver. 10 through 160 meters and standard broadcast band. Built-in noise limiter — adjustable squelch — BFO. . . \$15.90 down . . . \$8.66 a month for 18 months.

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RADIO SUPPLY

director of 2nd Call Area TCPN, K2SBT and K2VAB have six states to go for WAS. K2VAB announces the formation of the Eastern States Novice Net, on 7160 kc. at 1100 EST with K2VAB as net control. K2GIF was appointed personnel and publications chairman for New Jersey MARS. K2MFX is back on the air. ADE was a recent speaker at the Delaware Lehigh Amateur Radio Club. K2SYB is building a new modulator for his DX-35. BRC reports that NJN has gone on a 7-day-week basis with net sessions on Sun. The Sunday sessions are at lower speeds and ZVW is the NCS. New calls heard on NJN are RW, K2VAB and ZHK. Old-timers returning to NJN after long periods of absence are NAK, CQB, and K2MSX. The TCRA is well along with Field Day plans with K2MYQ as coordinator. Recent club speakers at the TCRA were GHK, TWC and K2OQG. NJN lost his antenna during a recent storm. 4UWA/3 is being transferred to Germany for Army duty. K2RRH is building a new rig. K2NLZ and K2LEK are new Novices in Lyndhurst. CFB edits a club bulletin for the Ocean County ARA. GKE passed the Extra Class exam and received his DXCC certificate with 103 countries confirmed. K2BHQ had a temporary drop in traffic sleds. The GSARA and the FMRC made a trip to ARRL Apr. 26. The Ft. Monmouth Club, K2USA, is equipped with all new gear. GUV is waiting for delivery of a new C.E. 100-V rig. K2QYI and VYY were visitors to the Metuchen YMCA Radio Club. IUC has joined MARS, and has also become a member of the Night Owl Net. MQT expects to work 10-meter mobile from Newfoundland during July and August. K2SBG has converted his Gonset for either 6 or 12-volt operation by the flick of a switch. K2PZV is building a 6-meter linear final utilizing 4-400A. HDW, net mgr. for NJN, has issued his second net bulletin. K2PSX suggests we hold a NJN QSO Party. Drop the SCM a line and express your views on this. K2PSX is looking for contacts with Warren, Cape May and Hunterdon Counties for WANJ. K2HHH has passed the Tech. Class exam. PWX is laying low until the 144-Mc. skip sets in. K2ICE is knocking the DX off on 144 Mc. Traffic: (Mar.) K2RRH 255, OAM 150, W2VW 121, MLW 93, RXL 75, BRC 59, K2QYI 45, GIF 38, W2OXL 34, K2VAB 34, GER 28, ZHK 26, W2EWZ 24, TOD 20, W2NRF 20, K2UNL 20, W2WQJ 18, K2BWQ 16, W2KFR 15, BVE 11, EBG 10, K2BHQ 7, MFX 7, ULF 6, W2CFB 5, CVW 5, K2MFF 5, W2N2ORL 8, W2QYW 8, K2NSQ 3, K2BHQ 2, W2CJX 2, K2JTU 2, KVR 2, W2NIY 2, K2QFG 2, SYB 2, W2IUC 1, PSU 1, RZO 1, KN2ZOR 1.

MIDWEST DIVISION

IOWA — SCM, Russell B. Marquis, W6BDR — New officers of the Cedar Valley Club are LPK, pres.; YBE, vice-pres.; DGF secy.; KJ1JY, treas. The Central Iowa Club's officers are GVG pres.; SLC, vice-pres.; EFL, secy.-treas. The Graceland Ham Club of Lamont has been reorganized with ZVA, pres.; W. Groner, vice-pres.; M. Miller, secy.-treas. New appointments: K9MIB and LKL as ECs and IQB as OO. NYX and GXQ renewed their ORS appointments. LTE, pres. of Hygain Antenna Products, gave a demonstration for the Marshalltown, Cedar Rapids and Burlington Clubs. Story County has begun organization of RACES. The u.h.f. committee of the Cedar Valley Club is giving certificates to any station working 50 Iowa stations on 6 meters. K6JJW has dropped the "N" from her call. GXQ received his BPL Medallion. The 160-Meter Net will hold its picnic June 8 at Clarion. BLH has a new NC-300. Traffic: (Mar.) W6BDR 1733, SCA 1606, LCN 1382, PZO 1137, LGG 956, K1CLS 582, W6GXQ 527, CZ 508, K9NMIZ 130, K9OHO 113, W6QVA 99, BLH 89, K6CYF 89, W6LJW 82, K6BLJ 73, W6NGS 47, WVF 46, K6DON 45, WAD 35, W6SLC 31, ITD 27, K6AHZ 23, W6BTR 23, NYX 21, IUY 20, VI 20, BTX 19, GQ 18, FMZ 17, NTB 17, K6GXC 15, W6CGI 14, K6APL 12, HBD 12, IGU 12, W6JPJ 11, VLF 11, K6BRE 9, EXN 9, DVO 8, W6PTL 8, UHO 8, ZAU 8, K6GOQ 7, HFQ 7, W6REMI 7, MEL 6, K6BPE 5, W6FDM 5, HNE 5, VQX 5, K6FEP 4, GHF 4, W6JDV 4, K6BLHH 4, W6LSF 4, COD 4, KJ1JY 3, AAH 2, W6PKQ 1. (Feb.) W6GHZ 1.

KANSAS — SCM, Earl N. Johnston, W6ICV — SEC: PAH, RM: QGG, PAM: FNS, U.H.F. PAM: ZJB. The Chippewa ARC of Ottawa announces the following new officers: KMER, pres.; WVI, vice-pres.; IXA, treas. Code and theory classes are held each meeting. The KVR of Topeka started code and theory classes Apr. 1 with 40 enrolled. The Mike and Key Radio Club of Parsons sent over 400 messages to Pittsburgh for the Cerebral Palsy Telethon Mar. 8. QQZ, Kansas State's club station, at its annual open house handled 268 messages with the help of K6BIX, DPS and HVJ. K6NLF, of Wichita, is the first Novice to earn the (Continued on page 128)

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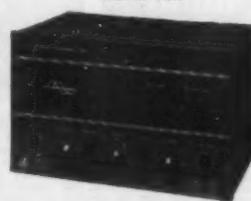
MODEL 10B - 10 watts PEP. Plug-in coils 160 thru 10 meters. Perfect voice control on SSB-DSB-AM and PM - CW breakin: Carrier and calibrate level controls. 40 DB suppression.

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MODEL 20A - 20 watts PEP. Bandswitched 160 thru 10 meters. SSB-DSB-AM-PM and CW. Magic eye monitors carrier null and peak modulation. Ideal for driving AB¹, AB², and most Class B linears.

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Fine quality, general coverage 4-band receiver (540 kc to 40 mc.) with calibrated electrical bandspread for 10, 11, 15, 20, 40 and 80 meter bands. 12" slide-rule dial has edge and backlighting. Has gang tuned RF amplifier stage and separate temperature compensated front end frequency converter. Has 100 kc CW and SSB BFO for CW and SSB. Has two IF amplifier stages and two audio stages with tone control, separate antenna trimmer, RF and AF gain control, automatic noise limiter, and "S" meter. 16-13/16" W., 10" H., 10% D. Shpg. wt. 35 lbs. **NATIONAL NC-188** Net 159.95
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A 12 tube superhet receiver with dual conversion. Full dial coverage of 6, 10, 15, 20, 40, 80, and 160 meter bands, every 50 kc on 6 meter band. AVC operates on RF and IF. Q multiplier continuously variable from 100 cps to 3 kcs. Separate stabilized BFO and linear detector for SSB and CW reception. Antenna compensator for 160-10 meter bands. Built-in 100 kc crystal calibrator and transmission line. Calibrated "S" meter. New series type noise limiter. Built-in 100 kc crystal calibrator. For 105-125 volts, 50-60 cps, 16 1/4" L x 9 1/4" H x 9 1/4" D. Shpg. wt. 33 lbs. **HQ-110-Receiver—Less clock-timer** Net 229.00
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SOS Award. HAW, of Hamlin, is working on an engineering degree at K.U. with a little time for 2-meter activity. UOL, who is publishing the *Midwest Relay*, successor to *Midwest Chiz*, is doing a nice job. The Wheat Belt Amateur Radio Club is planning on a weather net and practically covers the Northwestern part of the State. The Eldorado Amateur Radio Club also is making plans for a weather net for its local bureau. Traffic: (Mar.) W8TOL 816, OHJ 686, K9THA 404, W6FNS 294, QQQ 268, UOL 251, ORB 180, QGG 128, ABJ 116, K6BXF 89, W8SYZ 65, K9HVD 55, W6IFR 30, LEW 28, K9IZM 27, W8HVG 26, FDJ 24, SAF 24, K6BIX 23, W8RJF 21, UTO 17, K9NLLJH 13, K9WAL 13, W6ICV 12, IRE 7, K9MEF 7, W8ECD 5, K9IPL 5, W8HLL 3, ITO 3. (Feb.) W8BLI 310, K6BXF 27, IRL 11, EQY 4, W8LZJ 4, VGE 4, LOW 2. (Jan.) K9IRL 7.

MISSOURI—SCM, James W. Hoover, W6GEP—Net reports: MEN, 10 sessions QNI 343, QTC 70; NCS, BUL 1, DWX 5, OHC 4, MON 32, sessions 44 reports; QNI 199, QTC 100; NCS, OUD 25, GBJ 5, RTW 3, PME 1. The Heart of America Radio Club Emergency Net has been reactivated and operates on 29 Mc. at 8 p.m. each Wed. KN9LGZ has been appointed NCS for the Regional Novice Net operating on 7152 kc. at 1730 each Sat. A 6-Meter Civil Defense Net in Kansas City meets on 50.640 Mc. at 8 p.m. each Mon. IGU has replaced WPS as St. Louis Area RACES Radio Officer. WPS is Deputy Chief of Communications. The Southwest Missouri Amateur Radio Club's (Springfield) roster shows 41 members. Members of the St. Louis Amateur Radio Club demonstrated amateur radio ability in emergency communications to a group of 175 Explorer Scouts. Congratulations to Ruth Vollrath, who is handicapped by blindness, on receipt of her Novice call, KN9ONK. IFC, St. Louis, worked K6DWC, who was operating 6-meter aeronautical mobile at 16,000 ft. over Iowa. KLQ, Jefferson City, has been working TAF, Creve Coeur, regularly on 6 meters. CKQ worked H6CJW on 6 meters leaving only Asia for WAC. EBE has returned home after hospitalization. WAP has a new Ranger and electronic t.r. switch and is enjoying the full break-in operation. KN9LRG has a new SX-99 and a Globe Chief. EPI has a new HQ-110. BVL attended the IRE Convention in New York. Traffic: (Mar.) W6CPI 1211, GAR 528, GBJ 200, BVL 236, VVU 143, K6LNQ 130, W8WIK 124, OUD 92, K9HYZ 78, BHQ 61, W8IIR 58, PME 58, OVV 55, RTW 40, HUI 39, K6LWX 35, W8KA 32, CRQ 22, VZB 15, WAP 14, WFF 14, BUL 12, K9DEQ 7, W8F 7, GEP 7, KN9JPH 7, LGZ 6, ONK 6, W8WYJ 6, KN9LRG 5, W8EBE 3. (Feb.) W8WWF 48, K6LWX 24.

NEBRASKA—SCM, Charles E. McNeel, W6EXP—DDT reports the Nebraska C.W. Net had 31 sessions with QNI 334, QTC 145 and 20 stations on roll call. MAO reports the Nebraska 75-Meter Phone Net had QNI 599, QTC 62 with YCY back on roll, making a total of 37 members. The Nebraska Slow-Speed Net reports QNI 260, QTC 110, 100 per cent QNI K9HVG. K6CBV handled Burlington traffic with NHT during the sleet storm when the wires were down. MOL is operating on 10 and 15 meters. AOQ is on RTTY with a new machine. The SOO Radio Club, QRK pres, meets the last Wed. of each month. DQN has moved from Potter to Steamboat Springs, Colo. and will be on 75 meters looking for the Nebraska gang. The Western Nebraska Net, NIK as NC, reports QNI 624, QTC 91 100 per cent QNI BMQ, NIK, K6LFJ and K6LTR. The Morning Phone Net, daily at 0730, had 31 sessions QNI 537, QTC 100, 100 per cent QNI K6DGW, K6BDF, K6HKL, LFJ, SCT, K6VZ and NIK, with 30 stations on roll call as of Mar. 31. K6DGW is operating a new Globe Champ. BSE is on with a new Viking. Traffic: W6DDT 209, MAO 140, W6DGF 120, W6JF 101, K6DBF 64, W6NJK 57, VZJ 47, K6KUA 41, W6ZOU 35, KDW 34, OCU 29, LXS 26, OKO 22, SPK 22, K6HKL 19, W6VEA 18, EGQ 16, IFJ 12, OON 11, K6CDG 8, W6RIN 9, PDJ 8, PUT 8, URC 8, K6CMB 7, W6DQN 7, K6ELQ 7, ELU 7, FDB 7, IFF 7, LTR 7, W6QHE 7, BOQ 6, HOP 6, NHS 6, LJO 5, QKR 5, AFG 3, CIH 3, EFV 3, K6CYN 2, HAV 2, W6JJO 2, KLB 2, MTI 2. (Feb.) W6SQE 151.

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Victor L. Crawford, WITYQ—The Mayor and City Council of Torrington attended the official opening of the CQ AR Club house. PAM YBH reports CPN handled 378 messages during 31 sessions with an average daily attendance of 33. High QNI goes to DHP, YBH and K1BEN with 31 each. HID 30, TVU 29 and K1AQH 25. K9IBJU and KN1CEC dropped the "N." MDB joined the Women Radio Operators of New England and received Deep

(Continued on page 139)



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2-ELEMENT BEAM

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3-BANDER BEAMS

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Electronic disconnect, essential for instant and automatic change from band to band . . . is highly effective. It is accomplished without coils by special concentric elements which are part of a completely new and original Gonset antenna design.* The effectiveness of properly designed quarter wave sections as electronic disconnects is well known.

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3-Banders now use "Boots" to seal off the open-ended concentric elements from dust and moisture. These "Boots" are of the highest grade silicone rubber, have very low losses, do not absorb moisture, will not become brittle under exposure to sun and weather. They tend also to maintain element concentricity and to lessen vibration.

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All elements are factory cut to correct length. 20 meters requires no adjustments. 10 meters has fixed-length parasitic elements, requires adjustment only on the driven element. 15 has adjusting sleeves on driven and parasitic elements. Adjustments are made on the ground by short, sturdy tuning sleeves which are permanently clamped after setting to specified position. You set 'em and forget 'em.

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GAIN . . . VSWR . . . FRONT-TO-BACK RATIO . . . WEIGHT . . . FEED.

FORWARD GAIN: (typical)

3-ELEMENT: 10 meters, 8.4 db., 15 meters, 8.1 db., 20 meters, 8.2 db.

2-ELEMENT: 10 meters, 5.3 db., 15 meters, 4.9 db., 20 meters, 5.0 db.

VSWR (typical) either beam: Not more than 1.4 to 1 across phone or C.W. band segments at heights greater than 35 feet.

FRONT TO BACK RATIO: 3-element, 24-28 db. 2-element, 14-18 db.

WEIGHT: 3-element, 65 pounds, 2-element, 35 pounds.

FEED: Both beams are fed with single RG8/U cable.

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Sea Dragnet Certificate No. 86, IRX, GVK and EJH joined MARS. DHP received a TCPN certificate and joined the Mansfield Volunteer Fire Co. to help coordinate the radio net. MWB got KC4AF on 14 Mc. with a new 240-ft. antenna. KNIBHM got his Tech. Class license. EXO in Torrington, GTG in Hamden and KLK in Meriden are new on CPN. KIBEN is transmitting Official Bulletins daily on 3900 kc. at 1200 EST. TCW has a new 73A-4. KNIEJS is a new Novice in Torrington. JJL has a new HT-32 and SX-101. The CQ ARC had QNI of 69 during four net sessions with traffic handled totaling 10. New officers at YU are 9BAO, NRI and K2HZL. EFW has eliminated his transmitter trouble. The CVN handled 39 messages during 13 sessions with an average attendance of 10. High QNI goes to FHP, KIBML, KNIBMM, FFF, KICJJ and KNIDDY. New stations on CNV are NLC, WHR, EJH, IPX, KNIEDC and KNIDDO. New officers of the Stratford ARC are RFJ, KZX, SBR and ZNA. KIDEA is a new General Class licensee in Bristol. RM KYQ reports 357 messages handled during 26 sessions on CN including 62 on the second session. KIBML and KNIBMM have a new Globe Scout 680 and a three-element 15-meter beam. IKB and WKW made DXCC the same time on the same day. The Connecticut 6-Meter Net moved 20 pieces of traffic during five sessions with an average attendance of 15. New appointments: KIBEN as OBS, VWB as OES, FSE as Windsor EC. Appointments renewed: KYQ as RM; AVS, GVK and KYQ as ORSs; LIG as OPS; FDJ, TCW and WX as ECs. Traffic: (Mar.) WIVBH 547, KYQ 356, KIAQH 316, WIAW 283, FYF 261, KIBEN 238, WIVQ 236, EFW 235, KLK 159, CUH 134, GVK 126, MWB 114, MQT 110, NJM 104, DHP 47, ULY 47, YU 45, BDI 43, RFJ 41, FCE 31, QJM 30, LV 25, GTG 18, MDR 18, VIV 17, GVJ 15, OBR 11, EJH 9, KIBFJ 8, WIKAM 7, KIBML 6, KNIBMM 6, WIECH 6, KIBHBM 5, WIVVV 4, FFF 3, AMY 2, AVS 2, EXO 1, HQM 1, (Feb.) WINJN 79, OBR 5.

MAINE—SCM, John Fearon, WILKP—SEC: QJA. PAM: VYA, PAM V.H.F.; JMN, RM: EFR. Traffic nets: The Sea Gull Net meets on 3940 kc. Mon.-Sat. at 1700; the Pine Tree Net on 3596 kc. Mon.-Fri. at 1900; the Barnyard Net on 3960 kc. Mon.-Sat. at 0800. New appointments: GPV as ORS, LWO as EC. Renewals: LWO and KIAKO as OPs, LWO as ORS. An Androscoggin River Flood Net is being planned with stations in Berlin, Rumford, Livermore Falls and Lewiston. The Lobster Net on 2 meters is expanding, with HQZ/1 on Mt. Washington as a relay. JMN is using an inverted "V" antenna on 75 meters. WAS may be heard occasionally on 2-meter RTTY. The St. John Valley Hamfest was held in Presque Isle Apr. 12. MJY is on the air from St. Agatha using a Globe Chief and an SX-28. The Sheepscot Valley Radio Club gives code practice Mon.-Fri. at 1900 on 3737 kc. KIBLL is the call at Crosby High School, Belfast. PXE lost his 10-meter beam. FV is building a 30-watt portable rig for the summer. JIS is back at Gardiner. VYA is installing a new heating system for his shack. KIGAV is a new ham in Madawaska. KIDVN and AGP are new mobiles in Bangor. DLC lost his 20-meter beam and missed his first DX Contest in many years. 2PRW and ZRH are now ICOP and KIGVX, respectively, in Scarborough. BTR, KIAQ and AND have DX100s. KIBQT is putting out a good signal with his Viking II. EOP and LWO are ECs for Calais and Waterville. KNIGKP and GKW are new Novices in Boothbay Harbor. FNI now has WAS, KICJY, AKO and KNIDYG have joined the AREC. Traffic: (Mar.) WILKP 191, IHN 99, QJA 63, CEV 59, KIAKO 44, WIEFR 35, GVJ 25, HYD 24, JMN 18, UDD 18, FVE 16, TGW 15, FV 14, BX 13, KIDVN 11, WIGPY 11, KIBXI/1 10, ANM 9, WILXA 8, OTQ 8, LWO 7, KIBYE 6, WILZK 5, KIBQT 3, BAY 1, BAZ 1. (Feb.) WIBX 11.

EASTERN MASSACHUSETTS—SCM, Frank L. Baker, Jr., WIALP—New appointments: DBY Chelmsford, SPL RO for Sector 1-D as ECs; K1AGB as OES, NTK and FRR as OPs and ORSs; MIX as ORS; UBC as OO. KIGAY is the Bedford Club's call. K1GFR is "Swede" Langston of our M.C.D.A. KNIGNN is PE's son. KIDYC is KIDJX's daughter. Congrats to EUT on winning the Mass. QSO Contest Trophy. UC, JSS, SEA, OGK, PCO, FEY and KIDDE are on 75 meters. EEE, LZW and VRW are on 10 meters. IFR, LVE, OIH, SIV, K1CLO, KN1, GVR, EFU, EFT, K1AIU and AIQ are on 2 meters. The Federation of Eastern Mass. Clubs held a meeting. South Shore Club held a meeting. GDJ is on 15 meters with an 813. OOP spoke on NC-62 v.f.o. at the GBARS. EUJ, FJJ and AQE lost their antennas in an ice storm. The Framingham Club had an auction. 4VQZ, MX, secy., wrote the club has a new rig and antennas. KNIBZQ has a Globe Scout. MEG has

(Continued on page 132)

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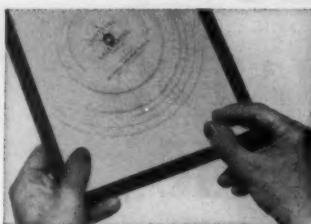
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new rig, a pair of 812s. K1DUT, Lakeville, is on several bands. The 6-Meter Cross Band Net is very active. New calls in New Bedford are KN1s EDS, EDR, GGU, GHB, ECO, EJX, GLX, EGY and EGU. KN1DIY has his Tech. Class license. The SEMARA visited the Fall River Club. EUT is on 20 meters. KN1s DUB, DWR, DWN and DYZ are on 2 meters in Winchester. WU is putting up his mast. The Sharon ARA is a new club. RCQ handled emergency information with EL28 regarding a hospital patient in Boston. HIL is ready for high power on 6 and 2 meters. MIX used to be a Navy radioman. BGW went to the RTTY dinner in N. Y. and the IRE Show. AKN is working with NX in Bourne. C. D. DPO is holding weekly classes for RACES operators. JMA spoke at the Braintree Club on the BC-221 frequency meter. ZEN had an operation. ZEN, UKO and JSS have All-Conn. Awards. The T-9 Club met at Kennedy's in Danvers. QRA had ICP speak at a meeting. K1AGB will have quite a set-up for 220, 144 and 50 Mc. MX has a new paper, *Sparks & Arcs*. TZ has his Tempco transmitter back on the air. We are sorry to have to announce the death of ex-IHHE, Don Ingalls. AHE lost part of his 24-element beam in a storm. Appointments endorsed: SPL, FHJ and BCN as OBSes; RCQ, FJJ and SMO as ORSes; AR and HIL as OBSes; HKG, Malden, BCN, Hyannis, SHV, Lynn, AR, Belmont, AKN, Sandwich, DWY, Beverly, KT Georgetown and DDC Ayer as ECs. DDC is active on many bands and building rigs and gadgets. The Concord High School RC, RNV, will be on with a DX-100 and a Super-Pro. WLP is a Town Member in Winthrop. Ex-1M8H is 4PNU in Florida. LMZ will be on 6 meters with a 2E28 rig. The Mass. State Phone Net, on 3870 kc. at 1800, still is active. We understand that QVK is the new Radio Officer for Sector 1-C. NJP is RO for North Easton. RUU will be on 2 but has been on 10 meters mostly. AJU is leaving our section and going to Florida or California. DIY helped DMD get back on the air. KIBUF is back on the air. ZADE visited up this way. Traffic: (Mar.) WIEMG 416, FJJ 189, AWA 155, EAE 128, CZW 100, EUT 94, DIY 68, UKO 63, AUQ 62, KN1DIO 38, WITY 34, UIR 33, KIDG 26, IBE 20, WIATX 14, LMZ 12, WU 10, KIBYL 9, WIION 9, JBD 9, NTK 9, AHP 8, RCQ 8, KIATO 7, WISMO 6, HIL 5, TZ 5, AKN 4, DTH 4, BQP 4, MIX 4, MX 4, BGW 3, BY 2, KIDG 12, (Feb.) WIDPO 12.

WESTERN MASSACHUSETTS—SCM, Osborne R. McKeraghan, WIHRV—Acting SEC: HRV. RM: BVR. PAM: MNG. The West Mass. C.W. Net on 3560 kc. is doing a fine job with several new calls heard recently. The Mass. Phone Net on 3870 kc. also is doing well with good coverage from both sections of the State. DZY has been appointed OBS. UEQ made BPL again. 4UWA/1 has been transferred to New Jersey. He expects to be shipped to Germany in June and looks forward to getting on the air with a DL-1 call. New calls in the Fitchburg Area are KN1s GFZ and GGA, both YLs. New Novices in the Pittsfield Area are KN1s GFT and GHR. JYH has made WAZ and has 250 countries confirmed. He also made a very high score in the DX contest with 555 contacts and a 280 multiplier. A good-sized group of v.h.f. men from the Springfield Area attended the annual V.H.F. Dinner in Hartford. The Berkshire County Assn. had a fine talk by CUT, of ARRL, at its March meeting. We are sorry to hear that ZEO will be leaving the section. He did a fine job as EC for North Adams and was one of the big wheels of the Hoosac Valley Radio Club. The Pioneer Valley Club of Holyoke recently voted to affiliate with ARRL. The Hampden County Assn. members learned a lot about crystals from Mr. Lewis of the E. B. Lewis Co., East Hartford, at the April meeting. The HCARA took third place in the national scoring for the January V.H.F. Contest. DKY has his new 6N2 working FB on 6 meters. JYH recently had a visit from 6BIP, a contest pal, and before the afternoon was over a regular gabfest was in progress with a number of hams from the W. Mass. Area and Conn. gathered at the JYH shack. Traffic: (Mar.) W1UEQ 1226, KGJ 110, BVR 72, TAY 69, DZV 48, DOL 7, AGM 6, JYH 4.

NEW HAMPSHIRE—SCM, John A. Knapp, W1AIJ—SEC: BXU. RMs: CRW and COC. PAM: CDX. V.H.F. PAM: TA. GSPN meets at 1900 Mon. through Fri. on 3842 kc. and at 0900 Sun.: NHN. Traffic Net, 1900 Mon. through Fri. 2883 kc. N. H. State RACES Net (BXU as NCS), 1300 Sun., 3993 kc. Thanks to QKA, Nashua, M., and K. Cub team, for the FB activities report of club members. BXU is building a 500-watt 2-meter final and has a new DX-100. K1COY is now General Class. RYD has a new Valiant on 20- and 75-meter sideband. Congrats to WBM and his new XYL. NZZ, EOW and KN1GDZ took awards for dis-

(Continued on page 134)

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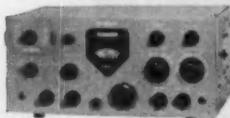
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plays at the Laconia High Science Fair. MXT and KN1ABM had exhibits at the Concord High Science Fair. KIBCS presented a ham activities program to the Franklin Kiwanis Club in March. YHI has a new three-element 10- and 15-meter beams. The North East V.H.F. Net is operating nightly on 145.29 Mc. New appointments: VAU, VBX and MEL as OOs; MEL as OBS. Endorsements: FUA as ORS; DYE as OPS, OO and ORS. BPLs go to KN1GDZ, EOW and KIBCS. Traffic: (Mar.) KIBCS 328, WIARR 95, HKA 93, ENM 63, GMH 52, MOI 52, KVG 37, YMJ 34, IIQ 10, EVN 9, FZ 4, CUE 2. (Feb.) KIBCS 970, WIEOW 107, HKA 105, KIBIP 20.

RHODE ISLAND—SCM, Mrs. June R. Burkett, W1VXC—SEC: PAZ, PAMs: KCS and YRC. RM: BBN and BTV. LSP has been appointed OPS. Endorsements include KIABR as OBS and BTV as RM, EC and ORS. VBR has been awarded a Section Net certificate. PAZ, YRC, KCS, BTV, BBN and VXC spoke to the group of 12 ECs, 4 OPSs, 40Ees, 3 OBSs, 5 ORSs, and 3 OOs in attendance at an Informal Discussion Meeting held Mar. 19 in East Providence. FII will return home from Europe about the middle of July. AYJ is on the air at DL4AADV and is looking for his R. I. friends on 20, 15 and 10 meters. HKN is building a kw. final for his Ranger. KIAOS has built a 6-meter converter taken from the *Handbook*. KIABR has added Ohio and North Carolina on 2 meters. AFN was a guest of the BVARC on Mar. 28. The PRA had an excellent turnout at its auction Mar. 11. K6KJY wants a schedule with any R. I. station. ZPG, CEW and WWN attended a dinner which was given for the personnel who have returned from Operation Deep Freeze II and report that this group really appreciates the operating done in its behalf by the American amateur radio operators. Traffic: (Mar.) WIVRC 118, VBR 75, TXL 48, HKN 41, BBN 24, YKQ 19, DDD 12, WED 7, KIAOS 4.

VERMONT—SCM, Mrs. Ann L. Chandler, WIOAK—SEC: EIB, RM: BNV. PAM: VYZ, V.H.F. PAMs: FMK and TBG. New appointment: KJG as Lamoille County EC. Appointments endorsed: KRV as ORS and ZJL as OPS. BXT has made his third BPL in a row. VTN held 24 sessions handling 71 messages. Top QNI go to JLZ 24, GQJ 21, KIBGC 21, ELJ 18. VTPN had good state representation clearing all traffic. A total of 240 messages were handled on GMN. NWN is running 100 watts on 50 Mc. with a fine signal. KKM is back on the air. MH enjoyed his trip to Mexico. KIBOL has a new GD-104 mike and Knight VFO. On 3.5 Mc. KIBKH is using a DX-100, a Knight VFO and an S-40 receiver. New Conditional Class licenses were issued to NXB and KIBSU. New Novices: GGK and GGL in the Burlington area and CYZ in North Westminster. VE2LI visited MMN and OAK. Traffic: (Mar.) WIBXT 741, OAK 187, JLZ 106, KRV 98, BNV 60, KIBGC 43, WIEIB 40, KJG 35, ELJ 34, LMI 15, 14, KICVY 11, WIVMC 9, ZJL 4. (Feb.) W1KRV 110, BNV 51.

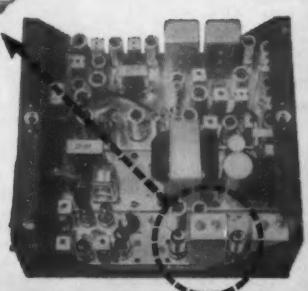
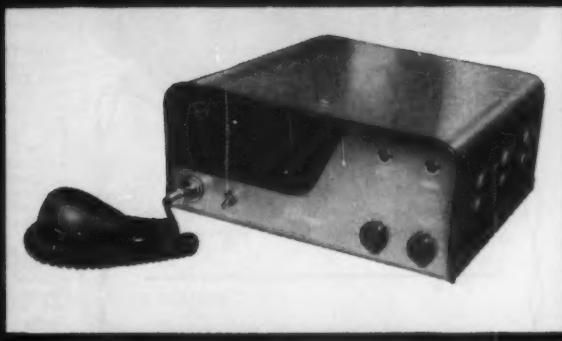
NORTHWESTERN DIVISION

ALASKA—SCM, Eugene N. Berato, KL7DZ—The Kodiak Amateur Radio Club elected BMZ as president. The club is now an ARRL affiliate. Plans are being laid for a very active Field Day program. DG reports from Adak: BEM is building a kw. final. ALU has erected a cubical quad, DG is bringing his Sonar 120 back to Kodiak with him. S.s.b. is very popular in the Kodiak and Aleutian Areas with ALU, EX, BUF, BDK, BEM and BDD very active on this mode. AWR is acquiring a new HT-32. KN8CCO is the first Novice on Adak. CKT has a new Champion 300 and his XYL is studying to be the first YL ham on Adak. W3UYN/KL7 and WIWCC/KL7 are on at AIZ with s.s.b. CDV has a new all-band vertical that can take the williwaws. The EARS (Eskimo Amateur Radio Society) at Fort Richardson elected BRUPres.; CKB, adm. vice-pres.; W3JDV/KL7, tech. vice-pres.; Ernie Moody, secy.-treas. W5UIW/KL7 got the first thunderbolt in town. CDG reports little or no 6-meter activity for the month. CIX has a new 6-meter Communicator. Traffic: (Mar.) KL7BJD 218, ALZ 57, CDF 23.

IDAHO—SCM, Rev. Francis A. Peterson, W7RKI—OCR is trying hard to get surplus material available for all RACES members. Sign up now with him. *Ham Hill News* carries the lists of items. PIT is making a regular newspaper out of the *Hambone*. RKI visited DPD, EF, OCR, GRU, AXY, BBS, HOV and UBC right after Easter. DPD has a new inverted "V" antenna for 75 meters. EF and VQC had rig trouble again. C.d. groups are planned for Moscow and Lewiston. EQQ, Helen, is the new FARM Net NCS and CZW is manager. Thanks to WNR for an FB job.

(Continued on page 156)

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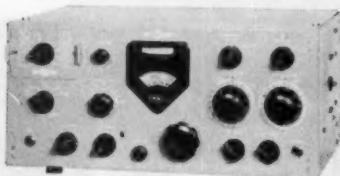
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RADIO SUPPLY

IBC has 300 watts c.w. at Malad, GOX, at Moscow, has a ban on antennas. CPY spoke to the Pocatello club recently. The club has a new call, DAX, with a DX-40 and an NC-109. New Novices and mobiles abound. SKP's mobile went dead on his visit there. CDA is planning a new TV station. Let's clean up the sloppy operating between 75 and 2 meters and improve operating standards before the FCC mobile unit monitors your area. More friendly Official Observers are needed. Traffic: (Mar.) W7VQC 32, EQ 28.

MONTANA—SCM, Vernon L. Phillips, W7NPV/WX1-SEC; KUH, PAM: EOJ, RM: KGJ. The Montana Phone Net meets Mon.-Wed.-Fri. at 1730 MST on 3910 kc. The Missoula Area Emergency Net meets at 0900 Sun. on 3890 kc. K7AVJ, W7BJT, KNT7DAD and W7EMI were prize-winners at the Billings Science Fair. New calls: KNT7BND at Livingston; KNT7CPJ, K7CWT and KNT7CZ at Billings; KNT7CZQ at Logan; KNT7DAD at Ryegate. K7ARX moved from Livingston to Casper, Wyo. K7BPF moved from Roundup to Plentywood. OIQ moved from Bozeman to Great Falls. New officers of the Old Faithful Radio Club are Pete Langdorff, pres.; KN7CHA, vice-pres.; RZY, secy.-treas.; and Bill Zinger, act. mgr. The Harlo Ham Picnic will be held June 8 in Wheatland County Park at Harlowton. The 24th Annual Glacier Park Hamfest will be held July 19-20 at Agassiz Camp Grounds in Glacier National Park. The 26th Annual W.I.M.U. Hamfest will be held Aug. 2-3 at Big Springs, Idaho. Traffic: (Mar.) W7MM 78, SFK 49, TYN 26, TVX 23, OOG 12, NPV 8, COH 7, K7BVO 5, AXD 2, W7BKB 2, JFR 2, CQC 1, EWR 1, TGM 1. (Feb.) W7MM 96, F12.

OREGON—SCM, Hubert R. McNally W7JDX—YUN now is operating full break-in. OMO is working hard for his 30-w.p.m. sticker. A new 6-meter net in Portland is operating on 50.55 Mc. and meets each Sun. at 2000 PST. Anyone hearing them, give them a voice break and check-in. The Portland ARC is working on the 6-meter RACES Net along with the conversion of ARC-5s for use on 6 meters. We regret to announce the passing of JQQ, of Portland, who received many write-ups on his v.h.f. work with model planes, lawn mowers, etc. SUX has a new Communicator III. LT rendered help to friends in Alaska. QYS is Globe Kinging again after serious transformer trouble. QWE still is trying to complete WAS, YL and XYL scores. ENU announces the arrival of a 9-lb. baby boy. JLU is a new OBS. YG renewed as OBS. The OSN had a good month in March in spite of good weather, with AJN, OMO, BVH and ZFH making BRAT. LVN has a new baby daughter. The Dalles ARC's new officers are SNA, pres.; BZC, vice-pres.; AIZ, secy. The Astoria ARC's new officers are THX, pres.; HQL, vice-pres.; EUC, secy. QSL Mgr. AGS, of Salem, had a session in the hospital at Boise, Idaho, but is better now. Traffic: (Mar.) W1APF 844, CUW 84, AJN 52, OMO 51, LT 35, ZFH 31, BVH 29, SUX 29, YUY 22, SPB 21, JDX 18, GAJ 16, YG 4. (Feb.) W1QWE 37, VBH 18, QYS 14.

WASHINGTON—SCM, Victor S. Gish, W7FIX—This is the last report of your present SCM. Thanks to all of you who have been so good about submitting reports regularly — it helps to make the job easier. At this writing ballots are now out for you to vote for either OE or PGY for your new SCM. AIB is continuing with his efforts to get all of the WSN to take ORS appointments. AMC is checking in on WSN regularly. BXH is using a BC-474 and getting FB reports. LVB is thinking of putting up a vertical for 80 meters. GJS is a new WSN member from Moses Lake. FZQ is slacking off on traffic and at present is busy trying to keep the car going. CWN still has projects in the fire and reports some traffic for a change. GVV reports there will be no activity until mid-summer. JEY has about finished with school and should be back in Salkum when you read this. NWP now is using a DX-40 — also reports an ulcer. Any connection between the two? RGL is sending OB on 3700 kc. at 1830 PST Tue., Thurs. and Sun. W7HXE passed the Tech. Class exam. AVM is trying to get the Aberdeen gang to go in for ORS/OPS appointments. The Valley ARC reports new officers are UZE, pres.; ZMG, vice-pres.; K7AFU, treas.; ISM, secy. OEB will handle the Field Day activity this year. HUT now has a 75-meter antenna up. The Clark County ARC held a hamfest on Mar. 7 with 133 attending. Traffic: W7BA 1701, PGY 594, K7WAT 279, W7DXZ 141, AIB 86, APS 72, AMC 66, WQD 61, QLH 45, WVU 40, BXH 29, LVB 25, CTO 18, GJS 15, HUT 13, FZQ 6, CWN 5, GVV 5, JEY 4, NWP 2, RGL 1.

PACIFIC DIVISION

HAWAII—SCM, Samuel H. Lewbel, KH6AED—
(Continued on page 138)

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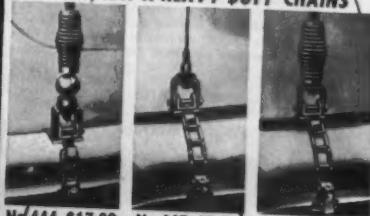
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Boom Length: 104"
Longest Element: 17'10"

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15M - 3 ELEMENTS



35 lbs.
Boom Length: 142"
Longest Element: 23'10"

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20M - 3 ELEMENTS



48 lbs.
Boom Length: 212"
Longest Element: 35'9"

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Carefully engineered, incorporating the latest design principles for top performance, the hy-gain monobanders are factory pre-tuned and pre-matched. Complete with easy-to-follow instructions for assembly, these beams sold with 1 year guarantee. Features include large diameter elements and ruggedly built Boom/Mast clamps. Booms hot dipped galvanized steel for max. strength with minimum wind resistance. Elements 6061T6 alloy. Extremely simple to put up and into operation.

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Don't forget the ham convention to be held on Kauai this year. July 4, 5 and 6 are the dates and it will be sponsored by the newly-received Kauai Ham Club. AAJ, AWG, AYG, CKO and KS have received their RACES licenses. The Islands still are not represented in RN6. How about some traffic man contacting your SCM and getting us into the national picture? KW6CO is the latest call assigned on Wake Island, but KH6AZM has moved there and has applied for a KW6 call. Since your SCM spent a month on Wake Island, there will be no traffic reports this month. Any that were sent in will be reported next month.

NEVADA—SCM, Albert R. Chin, W7JLV—SEC: JU. Activities still are going strong in the Reno Area with good attendance at club meetings and hidden transmitter hunts. BJV reports the issuance of certificate No. 58 to CRT for 25 Nevada contacts and endorsement No. 8 to AZF for 50 Nevada contacts. A visitor to the March NARA meeting was HS1B, Al Williams, from Thailand, who will be looking for the gang on his return home. Watch for him on 10 meters. ZHW, now s.s.b. with a new Facemaker, is hoping this is the answer to TVI. TQE handled emergency traffic over the Red Cross Net during the heavy snows. Traffic was handled between Reno and Echo Summit, Calif., the site of some nine stalled Greyhound busses. TQE, a man of many talents, is assisting Mrs. Cottam, one of the teachers at Northside School, in conducting code classes for potential Novices. Be prepared. Field Day is around the corner.

SANTA CLARA VALLEY—SCM, G. Donald Eberlein, W6YHM—SEC: NVO, RM: ZRJ and QMO. K6YKG is a new ORS. Endorsements: YHM and ZRJ as ORS; JCG and RLB as OES; OFJ, QEQ, VCZ, VQK and ZWE as ECs; ZRJ as OO. Section net certificates were issued to PLG, K6YKG and K6SRC. The SCCARA will hold meetings the 2nd Mon. of each month in the c.d. room of the new City of San Jose Police Communications Building in the Rosa Street Civic Center. K6VJI lost his beam and tower in a wind storm but both have been replaced. K6BMP, K6TWW and K6BBW will operate portable under an XE1 call from San Felipe, Baja California, furnishing communication for those on the San Jose State College Natural Sciences Field Trip. K6OTR, K6YQT and WWJ have formed the South County Amateur Radio Service. DEF has joined NCN for traffic work. RSY is working at Lockheed MSD as an electrical technician. K6HGV reports that MTN has ten new members in locations needing traffic outlets. HJP is stationed in Washington, D. C. K6CZ is looking for RTTY stations for traffic work. K6LSG has been having trouble with the receiver. YHM added a cascade preamplifier on the 2-meter receiver. K6EWY is making a test with high-speed tape transmission of traffic to the East Coast at 70-100 w.p.m. QMO is looking for a 2 1/2-kw. generator for emergency power. ZLO was visited by 4PNJ/3, ex/6LFB. Traffic: (Mar.) K6GZ 336, W6PLG 267, QMO 260, RSY 226, K6EWY 210, W6BPT 177, K6GID 118, W6HC 96, YBV 76, K6DHO 50, W6OII 37, ZLO 34, YHM 30, AIT 28, DEF 26, FON 23, ZRJ 20, K6HGV 11, OTR 9, W6MMG 3, K6VJI 2. (Feb.) W6FON 20.

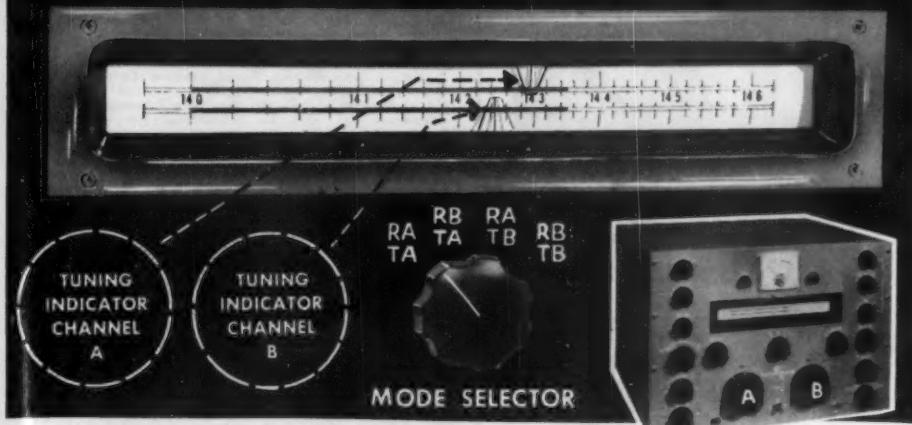
EAST BAY—SCM, B. W. Southwell, W6OJW—SEC: CAN, ECs: LGW, ZZF, IUZ, K6BYQ, EDN, GXU, JNW and JSS. K6UHE is building an a.m.-f.m. tuner with 10-watt amplifier. K6DMI is Asst. EC for the Richmond Area. AKB is over the 60 country mark with a new beam. QPY is liaison for NCN to RN6. K6KFF is running RTTY Official Bulletins on 50.9 Mc. The Richmond ARC hosted the March CCRC meeting. Congrats to ZUI and MJY on making WAZ. K6AXN is experimenting on 432 and 1296 Mc. and worked OJB in Sacramento on 1296. The EBRC had an FB meeting Mar. 14 at Cornell School. KH6ER is keeping in touch with his XYL via BSY and KH6ADK. ELP has a new 7-Mc. doublet. The Skyriders Net meets each Tue. on 23.588, kc. at 8 p.m. FDJ, past-SCM, is the new president of the ORC. The HARC has 53 enrolled in its Novice class. OAX has a new Hy-Gain vertical. The XYL of K6YAF had a bad auto accident, but is now out of the hospital. The NCN has five new members. The MDARC heard a talk on the problems of 6-meter TVI, followed by an auction. K6ZBL is a new check-in to NCN. K6ZNH's dad and brother took the Novice Class exams and the calls K6NOLC and K6QAN. K6POU is warming up a 322 on 2 meters. K6QXY and KAJPR are on 430 Mc. with 25 watts. The best DX is 50 feet! K6OGT and K6JPR are converting BC-645s for 430 Mc. LGS and FPs are now Tech. Class calls. Don't forget the East Bay Section V.H.F. Sweepstakes May 31-June 2. For further information see your EC or write the SCM. It is with regret we record the passing of JZ, former Pacific Division Director. Ray also was a past SCM of East Bay. K6DMW has a DX-35 and an HQ-129X and is Albany's mainstay on NCN. K6GK is modifying a

(Continued on page 149)

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1. Set tune selector switch to RA TA. Tune channel A to desired frequency. Peak transmitter. You are now set for the single channel transceiver operation.
2. Set tune selector switch to RB TA. Tune channel B to foreign DXing station. Tune channel A to any desired frequency inside the American ham band. You are now set to transmit inside ham band and receive DXing stations outside the ham band.
3. Set tune selector switch to RA TB. The same tuning procedure applies as to Mode 2 except channel A and channel B are now reversed.
4. Set tune selector switch to RB TB. The same tuning procedure applies as to Mode 1, except you are now transceiving on the channel B frequency.

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522 for the 2-meter net. K6OSO received his 20-w.p.m. sheepskin. KN6QNZ is a new Novice in Berkeley. K6GK made BPL for February and March. KA2MA visited NZ. K6ZBL has 50 counties for WACC and 28 states for WAS and runs RTTY on 6 and 2 meters. K6QHC is pushing 813s to a kw. and 105 countries. There are several appointments open within the section, including PAM and RM status. Contact your SCM for the appointment desired. Keep those reports coming in. The more the better. Traffic: (Mar.) K6GK 545, DMW 101, OSO 38, WJQH 20, K6ZBL 16, QHC 7, UHE 2. (Feb.) K6GK 715.

SAN FRANCISCO—SCM, Fred H. Laubscher, W6OPL—The report this month consists of activities by numerous operators who had their respective stations in readiness for any possible civil emergency during the heavy rains threatening the lives and properties of families throughout the State of California. Congratulations go to the northern area of this section: namely, the tri-county emergency drills which are held each Sun. at 1030 on 3720 kc. GQY, as usual, pounded brass to the tune of a 600 traffic count. A station activity report was received from SLX, in Eureka, who states that WSP/2 has moved to Eureka. Ed also tells us that the telephone company with its microwave did such an outstanding job during the heavy rains this year that it was not necessary for us to carry the emergency traffic load. Those of us who remember the California flood of '55 can truly appreciate the tremendous progress the phone company has made since this time. K6UFE has been handling traffic on NCN, along with liaison to RN6 and NCS for RN6. We never fail to receive a station activity report from GQA. Your SCM would appreciate a post card from you. I'd like to know what you are doing so as to let the rest of the gang share it with you. Top honors this month go to AWT, CZQ, GQK, K6CWS, SFO, LTX and CHL on their outstanding contribution to ham radio by helping to remind us of paragraph 12.138 of the FCC Rules and Regulations. Anyone receiving a specially designed QSL from any of these fellows will appreciate the labor involved. FB work, fellows! The fraternity needs and appreciates this constructive information. Traffic: W6GQY 609, K6UFE 119, W6OPL 12, GQA 5.

SACRAMENTO VALLEY—SCM, LeVaughn Shiplley, K6CCF—Mark your calendar now for the ARRL Pacific Division Convention which is to be held in Fresno June 7 and 8. Address all inquiries to the Fresno Amateur Radio Club, P. O. Box 783, Fresno, Calif. The Radio Amateur Mobile Society, Inc., now has over 100 active mobile members. Many thanks to BLW, who took it upon himself to submit a report from Oroville. If your town or area is not mentioned herein, submit a report to your SCM. K6ZNM and K6ZWI are new calls, having dropped the "N." K6ZWI had an FB QSO in a round table of 10, each in a different zone, within 30 minutes. SLV is on the road to recovery. The ink on the license of Mabel, K6QJQ, is not yet dry but she became very popular during her first QSO. She is the XYL of DVID. Welcome to K6LPE. We understand that K6LGU now gets "T-9" reports from everyone. We have two new "Generals," K6YLT and K6YS. SIA and K6RFT stacked up a few in the DX Contest. Oh yes, K6LPE has a traffic count of 1! New AREC members: K6LPE, K6RDF, K6HGG and K6GL. K6BV is a new ORS. JDJN is the new Dunsmuir EC. K6BYS is the new Chico EC. Welcome to PIV, who has returned as an OES. Thanks to K6DEO for the EC report. Traffic: (Mar.) K6BV 148, K6RPQ 8, K6LPE 1, K6YVV 1.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, W6JPU—SEC: EBL, EC: K6BGO. Don't forget the ARRL Pacific Division Convention to be held in Fresno June 7-8, 1958. The Hotel California will be the headquarters, with activities at the Memorial Auditorium. The officers of the Delta Amateur Radio Club are K6AXV, pres.; RRN, vice-pres.; and K6GBD, secy.-treas. ARE reports that the 2- and 6-meter station is operating in the new c.d. headquarters in Hanford. K6AZL wants it known that he is in Merced and not in Turlock, as previously reported. JUK got his W3DZZ beam up and reports fabulous reports. He also got a new SX-101. QFR got his W3DZZ beam up 60 feet and is pleased as can be. JPS has 21 states confirmed on 6 meters running 3 watts to a ground-plane antenna. NKZ passed his General Class test. K6ZCD is on 75-meter mobile with 10 watts. K6EJT is handling traffic on 20 meters. K6KYU is on 6 meters with a strong signal. K6TVU is a new ham in Corcoran. ZKH and K6WV are working on portable 2-meter gear. K6ANZ moved to Kansas City. The Tulare County Amateur Radio Club holds meetings in the new Court House Building basement the 1st Wed. of each month. ARC spent

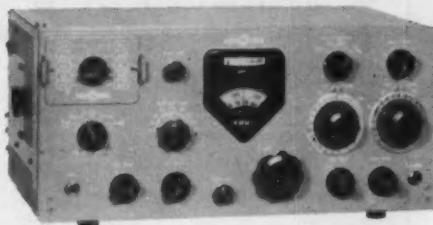
(Continued on page 142)



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two weeks at Treasure Island with the Navy Reserve. I need reports, fellows. See you at the Convention. Traffic: (Mar.) K6EJT 307, W6ADB 146, EBL 12, ARE 7.

ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, W4RRH—SEC: HUL PAM: DRC. V.H.F. PAM: ACY. HUL is busy changing the procedure on the Tar Heel Emergency Net in accordance with the amendments adopted recently. The State is divided into eleven areas and a copy of the call areas has been furnished to all net members. The AREC districts have been changed to correspond with the new net areas. Some areas will have three or more Emergency Coordinators while some will have only one. The plan is to have each EC responsible for having ONE representative on the Tar Heel Emergency Net with an area net established with the AREC on 2, 6 or 10 meters or some frequency other than 3865 kc. The key to this new process will be the EC. If he functions, then the program will be a success; if not, it is doomed to failure. ECs should give this top priority and get this done now. If you feel that you cannot go along with this, please notify HUL so he can replace you as EC. Charlotte is tentatively planning a big hamfest May 25. Asheville is tentatively planning a big one July 4-5. I get many fine bulletins from amateur radio clubs. I wish each club would write me giving the club name and officers. I would like to keep you informed via the *State Bulletin* on what is going on in the State.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—K4PJE has been appointed as SEC and VOS as PAM. AKC's RM appointment has been endorsed. The Lancaster Club, with K4OOH at the helm, listened intently to our talk and advice on c.d. and AREC, and also received much help on RACES from HJK, the director of c.d. for York Co. SOD is back on the State ready to resume activity in the AREC. Congrats to the Charleston Club on the new bulletin, QUA—W4HHO. K4POP and CPS can furnish details on this club's hamfest to be held May 3 and 4. FFH has one of the most elaborate station set-ups for emergencies in the State. K4KGP writes of the Cheraw Club meeting, 30 members from 5 counties, with HMG as guest speaker. HQK is hard at work with the S.C. Novice Net on 3745 kc. ZES is awaiting confirmation on WAC as DL4IX. K4ETB and DOA are busy with their Commercial Class exams. The Barnwell, N. Augusta, Aiken, Williston Ham Picnic will be held at Barnwell State Park, June 1. Officers of the Shaw-Sumter Amateur Radio Club are K4DWJ, pres.; K4OCU, vice-pres.; K2YR, secy.; K4OQV, treas. Traffic: K4BVX 188, GAT 100, W4PED 40, AKC 38, GQV 10, FM 0.

VIRGINIA—SCM, John Carl Morgan, W4KX—SEC PAK reports a very successful c.d. drill in Norfolk County. V.h.f. activity in the state is burgeoning; K4RK is sparking a 6-meter net with participants in Va., Md., Pa., W. Va. and the District Sun. at noon. The Richmond Area 2-Meter Net meets Mon. and Wed. and now has a link with the Norfolk Area. Drills with "club saver" portables are being conducted in the Norfolk Area. K4QES says his XYL, K4QER, earned the first Novice "Cradle of Democracy" certificate (a new award of the Lower Peninsula's Hampton Roads ARC). OES K4EYE is busy reporting the tracking of satellites to King's College. The VFN Annual Picnic officially is scheduled for June 15 at SB's farm in Fluvanna County. K2CQJ now is K4UAV at Warsaw, MG moved to Maryland and now is 3ML. We regretfully note the passing of BLE in March. LK headed for XE-Land for a few months. K4QIX reports a new long wire "coated with my blood and the XYL's tears!" AAD now has a 1-kw. s.s.b. linear final perking. K4ELG made WAS on 80 meters. CVO is chasing his Master's degree at G.W.U. while K4BYS and K4EAQ both are too busy colleging to do any hamming. K4ORQ blames inactivity on the new paupose. K4DWP dropped in on the SCM en route home for Easter. The Richmond Club reports QSLs continue to arrive for VA-JP-607 certificates having been issued on Feb. 28. Traffic: K4AET 545, ELG 354, W4PFC 314, K4KNP 294, W4QDY 273, K4EZL 220, QES 225, QIX 139, W4IT 75, VVG 63, BZE 60, K4PTG 52, DSD 42, W4KX 41, SHJ 41, K4GWO 40, W4PVA 25, K4ECD 27, W4BGP 25, IA 26, CIV 23, K4MEV 19, W4AAD 18, K4DPX 16, EAS 16, W4RHA 12, K4IP 11, W4LW 8, LW 8, OOL 5, CVO 3, KUJ 3, (Feb.) K4GWO 302, W4THM 105, K4ORQ 1.

WEST VIRGINIA—SCM, Albert H. Hix, W8PQO—Asst. SCM: Festus R. Greathouse, 8PZT, SEC: KXD. PAM: FGL. RMs: QBF, HZA, PBO, VYR. V.H.F. PAM: K4AON. K8GNW is operating in Iceland at

(Continued on page 144)

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TF2WBD, EAB has slowed up on his DX because of school work. VII is working good DX with his DX-100. SSA does a fine job in editing the Black Diamond Club's bulletin. KN5GJY is doing a fine operating job. K8HRO is a new OPS and OBS on the V.H.F. Net. The 50-Mc State Net has been organized to assist the Weather Bureau in obtaining data on river conditions in the Huntington Area and at other strategic locations. K8AON is doing a fine job as V.H.F. PAM. K8CRM is active on 75 meters with 13 watts and QSOed at W6 with that power. FUM is active with the Weather Bureau Net. FNI handles 80-meter traffic for relay to the Weather Net. LBN does the same thing on the 75-Meter Phone Net. DFO is building a new rig. JNF is a new ham in Huntington. CYW has a new mobile rig. ARF is active on 6 meters as is IBB. IEQ has a new five-element 6-meter beam. K8GWT dropped the "N" from his call. NYH is very active. K8HID has a new 20-meter ground-plane antenna. Traffic: (Mar.) W8FNI 145, VYR 108, HZA 25, BWK 41, HID 39, NYH 29, CNB 23, HRO 4, DDB 2. (Feb.) W8SNP 7. (Jan.) W8NYH 27, SNP 19.

ROCKY MOUNTAIN DIVISION

COLORADO—SCM, B. Eugene Spoenemore, W8DML SEC: NIT. PAMS: CXW and LJR. OBS: K8BTU. OO: OTR and RRV. NWJ tells us that the Rocky Mountain Radio Club in Gunnison is composed of 9 active members. K8KFQ is remodeling his shack and putting up antennas. K8MNQ, ex-1NAJ, recently moved to Thornton from W6-Land. YHL works 40-meter c.w. and 2 meters mobile. IA has been under the weather, but is doing fine now. K8GKR is running 300 watts on 8 meters. New 6-meter members are K8YFC and K8BTO. According to the *R-F Carrier IQV* and *QEL* are chairmen of the Western Slope Disaster Committee. CNM is working 2 meters. K8DCW, JCV and SAU are charter members of the DAV Amateur Radio Chapter in Colorado. Contact K8DCW for details. BWL says VE3EMF worked enough Denver stations for the Mile-Hi Award Sun. afternoon Mar. 2. K8KZY and K8AYK are penscratches and K8JCY is inkspiller for the *Splatter Chatter*. K8OOA, FCC engineer, gave a technical talk to the El Paso Radio Club. HFB recently won a set of tools for OM UPS in a contest. Traffic: (Mar.) K8BCQ 938, W8QKD 640, IA 586, WMK 491, K8DXF 190, DCW 154, W8QOT 131, K8DC 96, W8NVU 65, K8KZL 40, WZD 37, MDT 24, W8HYO 21, K8FQ 19, CBI 14, ENA 13, RRV 10, NIT 9, K8GUT 16. (Feb.) W8RRV 16.

UTAH—SCM, Thomas H. Miller, W7QWH—Asst. SCM: Col. John H. Sampson, Jr., 70CX, SEC: FSC. RM: UTM. PAM: BBN. V.H.F. PAM: SP. OCX gave the Novice exam to 16 candidates during March. UTM has both vertically and horizontally polarized antennas for 2 meters and can work both Ogden and Salt Lake from Bountiful, but he has to change polarization for each. OCX has earned the Rocky Mountain Net certificate. The minimum requirement is at least 67 per cent of the total check-ins for each of three consecutive months and RMN meets five days each week. W8H also is liaison station from RMN to PAN. K8JPO spent his spring vacation in Utah. K7BNZ in Richfield, is back on the air after 30 years with a DX-100. The Beehive Net, with NC8S CXZ, CYH, VEO and ZBL, has been running smoothly. HHW was elected NCS for the FARM Net. QWH was married Mar. 24. Traffic: W7EZM 25, OCX 18, BOD 17, ZBL 10, QWH 8, FSC 6, UTM 3.

NEW MEXICO—SCM, Allan S. Hargett, K5DAA—SEC: CIN. PAN: ZU. RM: DWB. V.H.F. PAM: FPB. OO: LEF and KCSW/5. ORS: DWB, WNU, RFF and K5IPK. OPS: KCSW/5. The Breakfast Club meets Mon. through Sat. on 7272 kc. at 0700; NMEPN, Tue. and Thurs. on 3838 kc. at 1800 MST and Sun. on 7272 kc. at 0730 MST; RMN, Mon. through Fri. on 3570 kc. at 1900 MST. A total of 103 students signed up for the Alamogordo Radio Club's code and theory classes. K5CEV is leaving Carlsbad for Puerto Rico. FHL is welcomed back as EC for Santa Fe. Remember the Rocky Mountain Convention to be held June 13, 14, 15 in Santa Fe. For further information write FHL in Santa Fe. BZA and BZB have refinished their ham shack. YNN received an RCC certificate. The Caravan Club will help Santa Fe with the forthcoming convention. The EC Net meets Sun. at 1800 MST on 3880 kc. All officials are urged to check in. The Totah Amateur Radio Club will spend Field Day at Four Corners USA, and contacts will count for the club's "507 Award" if a QSL is sent the club at P. O. Box 24, Farmington, N. M. Traffic: (Mar.) W5DWB 472, ETB 22, NQG 10, CIN 8, K5GDU 7, LOV 7, DAA 6, GYB 6, W5VSC 6, ZU 5, K5GYZ 4. LIDS 2, LFF 2, LOU 2.

WYOMING—SCM, James A. Masterson, W7PSO—
(Continued on page 146)

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SEC: MNW. RM: BHH. The Pony Express Net meets Sun. at 0830 on 3920 kc, with AMU and MW8 alternating as NCS. The YO Net meets Mon., Wed. and Fri. at 1330 on 3610 kc, with BHH, DXV and NMW alternating as NCS. QPP, chairman of the Wyoming Hamfest, which will be held West of Buffalo, Wyo., on U.S. Highway 16, reports that plans are complete for the annual get-together July 12 and 13. The Sheridan gang is sponsoring the event, which promises to be first-class operation with plenty of prizes. Additional details may be had by writing QPP, 362 E. Loucks St., Sheridan, K7CSW is a new call in Casper. Art has a DX-100 and an SX-76. NUT has a new NC-300 and a B&W 51SB. VHP has moved to Casper from Arizona. Ray has a DX-35 and an SX-99. Traffic: W7DXV 26, BHH 12, NMW 8, VHP/7 4.

SOUTHEASTERN DIVISION

ALABAMA—SCM, Clarke A. Simms, Jr., W4HKK—SEC: EBD. PAMs: DGH and KABTO. RM: RLG. With AREC membership climbing again, we are on the go. Still more members are needed, however, to fill gaps in the organization, particularly in the southern part of the State. If you don't know who to contact in your area to join, drop me a line. I'll be happy to assist you in getting organized. Congratulations to K4BWR and K4GBO, the first on a new shack and the second on a new boy. RJD is working the world with a new beam. LYA also has a new 3-band beam on a 60-ft. tower. ZSH got WAS and YRO has a 23-w.p.m. certificate. KX8BP, ex-W5DYD, wants Alabama contacts on 10 meters. Let's help him. Montgomery has shifted to 3965 kc, because of BCI. The net still meets Sun. at 1400 CST. AENO, the 6-meter net, needs representatives in the southern section. Contact K4JSP for details. K4KJZ is winner of the plaque as outstanding NCS of AENP for the last quarter. Traffic: (Mar.) W4RLG 189, K4BTO 57, W4KIX 52, YRO 43, K4EFG 41, W4WAZ 34, K4AOZ 32, JDA 28, W4OKQ 26, K4POZ 26, W4CEF 25, CRY 22, EJZ 22, MI 19, K4BWR 17, CXC 13, KJD 13, W4USM 12, CIU 11, K4KZQ 11, SIB 10, W4EHO 8, RTQ 8, AAQ 5, W4HKK 5, K4KAK 5, W4ZSH 5, K4GOW 2, W4HON 2, K4MQH 2, W4TOI 2. (Feb.) W4YRO 72, DGH 48, TOI 6, K4AAQ 3.

EASTERN FLORIDA—SCM, John F. Porter, W4KJG—SEC: IYT. RM: K4SJH. PAM: TAS. Section nets: FPTN, 3945 kc, 0700 Mon. through Sat.; FMTN, 7230 kc, 12 noon Mon. through Sat.; TPTN, 3945 kc, 1730 daily; FN, 3675 kc, 1900 Mon. through Sat.; GN, 7105 kc, Mon through Sat., fast session 0900 to 1000 and slow session 1000 to 1130; FEPN, 3910 kc, 1900 Tues. only. K4EXN is off to Georgia Tech. 3CUL is visiting again in Florida and is active with her portable rig. Two Floridian YLs participating in the YL-OM Phone Contest were BIL and KOM. Fran scored 15,104 and Ernie 7600 points. The Floridians held their annual meeting at the Sandhills Spring-Hamfest at Orlando. In order to create more interest in the Annual ARRL Field Day, to be held the last week end in June, the Staff of *Florida Skip* will sponsor an FD Trophy to the Florida winner. The trophy will be held for one year by the winning club then passed along the following year to the next winner. New General Class licensees in Dade are K4SYI, K4LNU and K4ONY. SJZ has a new Tri-Bander. IHW is back from K4-Land and sporting a new DX-100 and a RME-4350A. He will QSL all contacts upon written request. Your SCM visited with the West Palm Beach Radio Club Apr. 4 and renewed many old friendships as well as making new friends. The club will support the local RACES program. Traffic: (Mar.) W4DFU 717, K4SJH 623, W4IWM 667, LCF 265, W3CUL 4 247, W4HCQ 245, HNV 227, K4KDN 182, CFY 111, AHW 101, BLM 100, W4LMT 97, K4EXN 95, W4IYT 89, K4COO 83, AKQ 71, W4TKE 62, TAS 60, WS 49, K4BNE 48, W4FE 46, K4AEE 32, BR 32, ILB 32, W4FSS 30, CO2UG 25, K4JZJ 20, RLL 17, TFS 16, JVA 15, W4KZT 15, K4MTP 14, W4BJI 13, EHW 11, BWR 9, K4IWT 8, W4SJZ 7. (Feb.) K4DSN 509.

WESTERN FLORIDA—SCM, Frank M. Butler, Jr., W4RKH—SEC: PQW. RM: AXP and BVE. The USNMDL Club at Panama City, K4NDD, has a DX-100. ARRL Director ZD spoke to a large gathering in Ft. Walton in April. New or renewed appointments have been given to OID, CEF, APE, DLO, DSH and BVE. APE is an active OO in the Tallahassee Area. OID is QRT for transmitter pairs. DSH checks into the MARS and Alabama Phone Nets. CEF has made WAS, WAC and worked 70 countries with the Valiant. AXP is working on a high-power rig. *Florida Skip*, the all-Florida ham newspaper, needs more support in this section. Write me or IYT. The Pensacola

(Continued on page 148)

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One pair of Insu-Traps in a 107 ft wire, center-fed with co-ax, gives a high efficiency antenna, with automatic easy loading on 10, 15, 20, 40, and 80. Full KW. Pair, with complete instructions and wire clamps. 5 BDC — \$12.50

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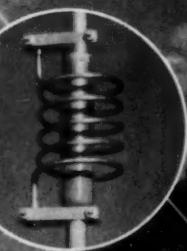
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- Pre-tuned center band operation of 10, 15 & 20 meters with one 52 ohm feed line; requires no switching, tuning or adjusting.
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- Traps are rigid air-wound self-supporting coils of 3/16" aluminum rod.
- Condenser is aluminum tubing with "Phenolite."
- Antenna is heavy gauge 615T6 drawn aluminum tubing. Coils, clamps and fasteners are also aluminum.
- Support is heavy wall pipe with set-screw to lock mast which may be any pipe 1 1/2" diameter.
- Radiator height — 13' 8"
- Radial length — 16' 8"
- Complete assembly is ready to install (less feed line) with radials and insulators attached — only \$28.50. Shipping weight — 9.5 lbs.



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Club Ladies Auxiliary got a full-page spread in the Sunday paper. LJK and his XYL have been transferred to Alaska. Mary was succeeded by the XYL of OOW as president of the PARC Auxiliary. K4RMO, RKH and K4OPF combined efforts on 40 and 10 meters to get an urgent message from LQU in Tennessee to his XYL. SYT is on s.s.b. with an HT-32 and a 75A-4. SJT has swapped the NC-300 for an SX-101. CEF suggests a W. Fln. net for traffic handling and/or emergency work. Traffic: (Mar.) WABVE 29, OID 13, DSH 9.

GEORGIA—SCM, William F. Kennedy, W4CEJ—SEC: K4AU'M. PAMs: LXE and ACH. RM: PIM. GCEN meets on 3995 kc. at 1830 EST Tue. and Thur., 0800 Sun.; ATLCW on 7150 kc. at 2100 EST Sun.; GSN 3995 kc. at 1900 EST Mon. through Sat. with PIM as NC; 75 Meter Mobile Phone Net on 3995 kc. at 1330 EST each Sun. with UUH as NC; ATL Ten-Meter Phone Net on 29.6 Mc. at 2200 EST, each Sun. with VHW as NC; GTAN on 7290 kc. at 1000 EST each Sat. with K4ORR as NC; GPYL Net on 7280 kc. at 0900 EST each Thur. with K4IFF as NC; The Kennebogee Emergency and Traffic Net on 29.46 Mc. at 2130 EST each Sun. We sure are sorry to hear the passing of HYW's mother. K4KIV has installed an HQ-150 receiver and a Viking Valiant at home. FGH is on the waiting list for a Thunderbolt. KNOCJ dropped the "N" and has a new WRL VFO to match the Globe Scout in Quitman. K4HOU has moved to a new QTH. ZWT did not have to send a single OO notice in March. PDP has a new NC-300 receiver. K4KVV has a new HQ-100 receiver. Amateurs at the U.S. Naval Air Station, Glynnco, Brunswick, Ga., have organized the Glynnco Amateur Radio Club with K4OKH, pres.; K4SVI, vice-pres.; K4ULT, secy-treas. LNG has recorded numerous passes of Explorer I and Vanguard I. The GSN still is looking for outlets in the Macon, Albany and Thomasville areas. Let's give the net hand. Don't forget to send your appointment certificates for renewal. Traffic: (Mar.) K4DQY 300, FCI 299, MCL 100, FBA 174, W4ETD 130, BXV 112, DDY 102, PBK 87, K4HOU 40, BAI 34, CZQ 18, W2ZWT 15, K4ACP 15, W4PDP 6, K4KVV 1.

WEST INDIES—SCM, William Werner, K4PDJ—SEC: 4AAA, AET and AHH are new on 3925 kc. from Arecibo. ZC now has dipoles coax fed. WX is mobile with Gonset twins. RK now has a Tri-Bander beam 40 feet high. ACQ installed a Q multiplier on the HQ-120. FAE put up antenna systems on 40-ft. poles at the U.P.R. PQ and KE are active. WP4ANG is the son of KE. AMG is the son of CK and CL. MV is building a 40-meter beam. MN now is at Caparra Terrace. OS visited P.R. after a 3-year absence in W2-Land. W3COO now is K4PAQN in Ponce. KD worked 24 new YL stations on 15-meter phone for a total of 109 in the YL-OM Contest. KD, YT, ADR and WP4ALY are using reflected power meters. WP4ALC graduated to KPA and is setting up a modulator for the DX-20. KD received cards from MP4BG and ZD4CM for 219 DXCC confirmed. W2IQC visited KP4-Land. MS skeds W2THD in Buffalo so RM can talk to his son there. ZN is the tax expert on electrical equipment with the Dept. of Internal Revenue. YT has a Telrex Christmas tree array for 10, 15 and 20 meters on a 35-ft. tower. KN4PXY, attached to the USCG Cutter *Sagebrush*, registered in the AREC and operates on 21 Mc. QEB is on s.s.b. with 2000 watts. ZC is building a 2500-volt power supply for p.p. 813s. ADR uses voice control on his transmitter. UW is back on the air, e.w. only.

CANAL ZONE—SCM, P. A. White, KZ5WA—W6BMO/MM, on the SS *Santa Elena*, and W2EZV/MM, on the SS *Pioneer Ming*, visited RV and VR when their ships passed through the Canal in March. Ex-BE, former RM of the Canal Zone, is now residing in Seattle, Wash., and is studying for his General Class license. The Caribbean Army MARS Net is active on 27.994-kc. phone Mon. at 2130 and Wed. at 2100 EST; also on 7350-kc. phone Sun. at 0800 EST. The MARS director is "Twigg" Branch, ACSJS, who plans other nets as participation warrants. New KZ5s are QQ, J. Smart; WR, L. Wrazen; and AG, W. Preston, Jr. New Novices are CIN, W. Karge, and HSN, Helen Shea. Traffic: (Mar.) KZ5VR 83, JJ 33, KA 23, RM 22, EL 19, WA 18, HO 16.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, Jr., W4JQB—SEC: LIP, RM's BHG and GJP. PAMs: K6BWD and W6ORS. The following stations earned BPL for the month of March: K6MCA, K6HLR, GYH, K6MIL, K6OZJ and ZJB. New appointees for the month are K6KZY as OO, K6HLR as ORS, K6KYJ and K6GLS as OB8s. K6MCA has a nice batch of new equipment.

(Continued on page 150)

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COMPANION FOR THE SIDEBANDER . . .

WRL's Globe Linear LA-1



Wired & Tested: \$124.50
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NEW BANDSWITCHING XMTTR. FOR 6 & 2 METERS



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3 Modes
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Sidebander DSB-100

No Obsolescence: Adaptable to Present AM Equipment: Standard Crystals & VFO Used

- ★ 100W PEP DSB Input, Suppressed Carrier; 40W AM, 50W CW; completely bandswitching, 80-10M; continuous coverage 3-9mc and 12-30mc . . . a complete transmitter, ready to go.
- ★ Minimum 35 db. carrier suppression on all bands; if one sideband QRM'd, receiving operator can switch to other.
- ★ Three-stage RF section allows straight through operation.
- ★ Internal tone generator facilitates tuning.
- ★ Pi-Net output 52-600 ohms; speech clipping and filtering for powerful communication punch and minimum band width.
- ★ 600V power supply has ample reserve for external accessories; socket supplied on rear of chassis.
- ★ Thoroughly TVI-protected; provisions for antenna relay control.

SUCCESSOR TO THE MODEL 755 VFO

WRL's VFO Model 755A



W/T: \$59.95
Kit: \$49.95

For 10-160M; output on 40 and 160M. Vernier drive with shock absorbing features. Complete with self-contained, well-filtered power supply with voltage regulation. Temperature compensated for extra stability for SSB or DSB. Ideal for use with Sidebander. Approx. 50V RF output; will drive oscillator stage of any Xmttr. on market; simply plug in crystal socket. New Forward Look Cabinet.

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- ★ Completely bandswitching for 6 & 2M. Power input: — 6M, 70W CW, 60W AM; — 2M, 60W CW, 50W AM.
- ★ Three-stage RF section allows straight through operation; all RF stages metered; all stages TVI-bypassed.
- ★ 52-72 ohm coaxial output matches all beams and most doublets. Variable antenna loading control.
- ★ Regulated screen supply; adequate harmonic and TVI suppression.
- ★ Ideal for operation with VFO Model 666; suitable for use as mobile Xmttr.; provisions for plug in mobile power supply.
- ★ Adequate reserve power for operating VFO, speech clipper, relay, etc., from auxiliary socket on rear chassis apron.

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ATTENTION HAMS

It may be easier than you think to get that NEW Johnson, Hallicrafters, Hammarlund, B & W, National, Fisher or Bell Hi-Fi, Telrex, RME, Gonset, Morrow, or other ham gear, if you have equipment to trade. We are always interested in Model #14, #15, #26, #28 Teletype machines, TD #14, perforators, reperforators, etc.; also BC-221, BC-348, BC-342, BC-610, ART-13, URM-81, etc.

Write or telephone Tom, W1AFN

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ment, a Pacemaker, a Thunderbolt and a 75A-4 receiver. K6UYK is building a new "Sputnik Chaser!" BES is putting up a 3-band quad. The San Gabriel Valley Radio Club is doing a bang-up job tracking the satellites. SRE took a trip up north and visited AZF in Reno. For all the younger fellows, the Teen-Agers Net is active on 3340 kc. Tue. at 1830 PST. Contact K6KVJ, the net manager. K6OQD is the new net secretary for MCAN-7. K6COP is working over antenna traps. HJJY now holds MTHC on SCN and ALN2. K6EPY moved from Venice to North Hollywood. K6DQA has a new Viking 500 on the air. K6EQ is batting it out mobile with G66 and G77. K6LOP is on 6 meters with a cool 300 watts c.w. and 200 watts phone. CIS is QRL with all the c.d. nets. K6PLW is helping to organize a club at Glendale High School. K6QMK reports 6-meter openings to the Southeast and South America. K6KUF will be operating from some remote Mexican Island as XE6KUF. Support your section net, the Southern California Net, which meets at 1930 PST daily on 3600 kc. DTQ, president of San Gabriel Valley Radio Club, announces that the club will award a certificate to any amateur who contacts ten members. To apply, send list of dates, times and calls to the tenth member worked. DTQ has more details. Traffic: K6MCA 1181, HLR 1063, W6GYH 767, K6MLL 685, OZJ 529, W6ZJB 425, BHG 245, K6UYK 169, OGD 160, EA 80, W6HJJY 76, K6KZV 75, QMK 62, KYJ 31, GCC 43, HOV 32, GLS 31, W6VSH 30, K6DQA 23, W6SRE 10, CIS 5, K6EPY 5, W6JQB 3.

SAN DIEGO—SCM, Don Stanifer, W6LRL—K6DVF, with K6HKY as his assistant, used mobile units of the AREC in San Diego City to help raise money for the National Cancer Society. Also assisting were the Sheriff Reserves. This is the second year Dave, a college student, has spearheaded this worthy cause. The new president of the North Shores Club is EWU; secretary is K6YLQ and treasurer is SK. The club call is K6HAL. The tentative dates for the Southwestern Division Convention are Oct. 10, 11 and 12. The Convention will be held under the sponsorship of the San Diego Council of Amateur Radio Organizations. The Vista Amateur Radio Club is now affiliated with the ARRL. The club call is VPU. The president is K6LHQ; who also is EC for Vista. KVB is now on s.s.b. 30QI is operating for the Marine Corps at YDK. K6UOD, in Yorba Linda, becomes the second San Diego single station operator to receive the BPL Medallion. Congrats to Harry on a fine job of handling traffic. K6ULJ continues to log and work good DX on 50 Mc. K6ITH is now in Jacksonville, Fla. K6LDI and IDE are now in KA-Land. Two students at Dana Junior High in San Diego passed their Novice Class exams during the Easter vacation. The Helix Club adopted a new constitution at its April meeting. The April meeting of the San Diego DX Club was held at the home of BZE. Traffic: (Mar.) W6YDK 857, K6UOD 541, W6EOT 169, BKZ 26, SK 11.

SANTA BARBARA—Acting SCM, Robert A. Henrike, K6CVR—From my reports Santa Barbara intends to be well represented in Field Day this year. The Pointsetta Radio Club elected NFT, pres.; LQJ, vice-pres.; Bob Kanthack, treas.; UOZ, secy. PZZ is now in the TV repair business. ALQ and OHX claim over 100,000 points in the DX Contest. WN6WQ is getting in some air time while baby-sitting the jr. operator. Nipome is on the ham map with K6NQOS on 40 meters. MSW's quad is pulling in some nice 20-meter DX. K6VDW is active on 2 meters in Grover City. JPP installed a new 75-meter antenna. K6DXW moved to a new QTH in Goleta. JFP has a Black Widow going on 2 meters and was up to Arroyo Grande for a nose-to-nose QSO with YCF and IHD. He just happened to have his new rig with him with the bottom cover off, making it real easy to admire. Traffic: W6YCF 9, FYW 5.

WEST GULF DIVISION

NORTHERN TEXAS—SCM, Ray A. Thacker, W5TFP—Asst. SCM: E. C. Pool, 5NFO. SEC: BNG. PAMs: K5AEX and IWQ. RM: ACK. Boy! Did I goof! I misplaced four traffic reports for February—two made BPL, too! My apologies. We are pleased to have NFO accept the job as Asst. SCM. Thanks to JQD for serving in that capacity for a one-year term. ZKT renewed as ORS. GY is meeting all c.w. nets. DNQ is now Army MARS. The NT-O handled 86 QTCs on Easter Day and had takers for all traffic. The new QTH of HGR and IKI is now Andrews. BTU and PVT are "limbering up" new kw. rigs on 75 meters. HGR is sporting a new Viking 500! Your SCM sure enjoyed the visit with the Midland ARC on the occasion of its Annual St. Patrick's Day Ham-Swampfest. The Jesuit High ARC of Dallas is now an ARRL affiliated club. K5IGD now is s.s.b. with a new 20A. DKT and GRH are doing an FB job editing and publishing the Wichita

(Continued on page 155)

At ARROW....Summertime Is Mobile Time



Meradeo MB-6 Receiver

Covers 80, 40, 20, 15 and 10 meter bands. Sensitivity is 1 microvolt or better on all bands. Signal to noise plus signal is better than 20 db. Crystal-controlled second mixer. Bandpass—4 kc at 6 db down. Integral—100 kc crystal calibrator. Illuminated "S" meter, converts to field strength meter for transmitter tune-up. RF and audio gain controls. Noise balanced squelch circuit eliminates inter-station noise but opens on extremely weak signals. Temperature stabilized for single side-band reception. Complete with 18 tubes. 11 1/2" x 4 1/2" x 7 1/4". Shpg. wt. 12 lbs.

Amateur Net \$239.50



Meradeo MB-565 Transmitter

80, 40, 20, 15 and 10 meter coverage. VFO/Xtal controlled. Gold-plated variable caps for low RF losses. VFO operates at 1/2 carrier frequency to cathode follower, then a class A buffer to driver operating as doubler. Driver final operates straight through on all bands at 60 watts input. Uses carbon, crystal, or dynamic mike. High level plate modulation. Operates into 50 to 75 ohm antenna or tuner. Antenna changeover relay built in. Illuminated meter measures all necessary currents and voltages. 10 tubes. 11 1/2" x 4 1/2" x 7 1/4". Shpg. wt. 14 lbs.

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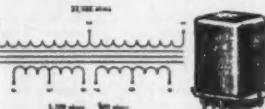
Lakeshore Phasemaster Models II-A and II-B

Band Switching: 160, 80, 40, 20, 15 and 10 meters. 65 watts PEP output from 6146 power amplifier giving sufficient power to drive nearly all types of linear amplifiers including grounded grid finals. SSB or DSB: Suppressed carrier, narrow band phase modulation or break in CW. Voice control and anti-trip circuits built in. Talk-on-frequency or Zero beat. Pi-Network Output: Matches 50-600 ohms impedance coax or balanced antenna output connectors. Voltage regulation of VFO, 9 mc oscillator and 6146 screen. Low pass filter in audio section gives speech cut-off of 40 db at 3800 cps. Temperature compensation in critical 9 mc circuits for improved stability. Novice or CW operation on 160, 80 and 40 meters with direct frequency crystals.

*Built-in VFO—1001: precision dial tuning, anti-backlash gears, no string or cable drives. Frequency stability and reset accuracy better than 100 cycles. Completely independent of Exciter section. Built in regulated power supply. Individual AC power switch allows VFO to be left on if desired.

*Applies to Model II-B only.

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Versatile Miniature Transformer

Same as used in W2EWL SS3 Rig—March '56 QST. 3 sets of C.T. windings for a combination of impedances: 610 ohms, 5200 ohms, 22,000 ohms. (By using the center-tap the impedances are quartered). The ideal transformer for a SSB transmitter. Other uses: interstage, transistor, phone patch, line to grid or plate, high impedance choke, etc. Size only 2" h. x 1/4" w. x 3/8" d. Brand new. Fully shielded. At fraction of Government cost. Amateur Net, each \$1.39 3 for \$3.49 10 for \$10.75



Relay Special

DPDT ceramic insulated relay with extra SPST contact. 12 volt DC coil. Ideal for antenna relay, or parallel all contacts and use as generator relay. Special Price \$1.75

Amateur Net Model II-B \$459.00



"Wonder Bar" 10 Meter Antenna

As featured in Nov. 1956 QST. Complete with 3-5W 3013 Miniductor. Only 8 ft. long for 10 meters.

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TS-13 Handsets

Push-to-talk butterfly switch. Handy units for use in mobile, CB units, ham use, etc. Complete with rubber covered cable and plugs. Shpg. wt. 3 lbs.

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12 Volt Dynamotor

Rated output: 625 volts DC at 225 ma. High efficiency; compact; no battery strain; latest design. Brand new, recent military production. 5" diameter, 9" long. Shpg. wt. 16 lbs. Worth two to three times this low price \$13.95



6 Volt Dynamotor

Rated output: 425 volts DC at 375 ma. High efficiency, compact. 4" diameter, 7 1/4" long. Shpg. wt. 13 lbs. Worth 2 to 3 times this low price \$12.95

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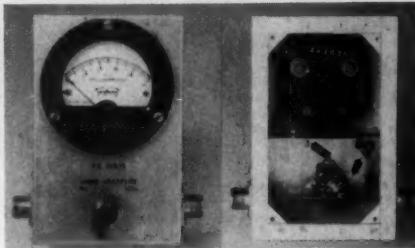


Fig. 21-30—Dual-range r.f. voltmeter for use in coaxial line, using a 0-1 d.c. milliammeter. The voltage-divider resistors R_1 and R_2 (Fig. 21-29) are at the center in the lower compartment. The by-pass capacitors and R_3 are mounted on a tie-point strip at the right.

THIS handy instrument may be just what you need to tune up that transmitter for maximum output. Or it may be used as a null indicator in an r.f. bridge you may use when matching that feedline to your antenna. A complete description of this useful device, and many others, appears in the Measurements Chapter of the big 1958 *Radio Amateur's Handbook*: 746 pages, over 1350 illustrations, charts, diagrams and tables.

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"SATURN 6" MOBILEER

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- Minimizes flutter and noise
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MODEL 5-1 "Saturn 6" Antenna

2-pc. adjustable aluminum mast, bracket, universal bumper hitch. No holes to drill. Co-ax feed line not inc. Net \$16.95

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Fitchburg, Mass.

Falls ARC paper. It is very informative. Amateurs, as usual, performed in "top deck" manner during the tornado in Wichita Falls Apr. 2, which was the anniversary of the Dallas "blow." K5GBS is "head-in out" to Korea for a spell. Thanks for the increase in traffic reports. Traffic: (Mar.) K5IGY 308, BNH 211, W5DAG/5 206, SMK 179, K5ETX 162, W5W 156, W5GY 94, K5ILL 71, W5BKH 70, BOO 64, K5CDF/5 31, HTB 28, W5CF 25, K5DNQ 22, ACD 18, BZL 11, W5BNG 6. (Feb.) W5ACK 506, K5LZW 151, W5SMK 118, K5BNH 85.

OKLAHOMA—SCM: Richard L. Hawkins, W5FEC—SEC: LXH. PAM: EJK and MFX K5LAP is retiring from the Army and moving to California. Paula, IOZ, is in the finals of the State Spelling Bee. EHC finds that 50 Mc. is good for local contacts. K5BNQ is busy with nominations for YLRL offices. QOD is heard on the nets again; now we need GZK back to sound like old times. K5INC was appointed as OPS. EJK resigned as PAM for 40 meters. Thanks for the FB job, Chief. MRK was busy moon-watching on 108 Mc. MMID worked 60 countries the first week end of the DX Contest. RRM was busy with a law suit and missed the DX Contest. GOL is heard checking into all the nets. YJ, at O.S.U., operated portable in the Student Union during Engineers Week and stirred up a lot of interest. EKA is due a fine hand for his work in helping K5NOV, who is blind, to get his transmitter working. The Lawton-Ft. Sill ARC originated a lot of traffic at the Eastern Pageant. Oklahoma's Ham of the Month: K5BBA, for his FB reporting job from Bartlesville. Traffic: (Mar.) W4RCM/5 408, W5ESB 135, K5INC 88, W5KY 88, JXM 66, K5DUV 48, W5FEC 40, KWK 31, MFX 29, FKL 28, K5CBA 27, EG5 27, W5ERI 26, K5LAP 26, KTW 26, W5PNG 23, MGE 18, IWL 19, VLW 18, K5CAV 17, EZM 16, W5GOL 13, K5BNQ 10, DUJ 9, W5IER 3.

SOUTHERN TEXAS—SCM: Roy K. Eggleston, W5QEM—SEC: QKF. RM: FCX. PAM: ZIN. It is with the greatest regret that we record LHZ as a Silent Key. He, his XYL and son were killed in a car wreck. The Houston Amateur Radio Club C.D. Net participated in its first emergency following an explosion at a rubber plant at Texas City. Congratulations to K5CAN on being made vice-president of F. H. Maloney Company. The good news has been received from the Oklahoma City gang on hotel rates for the West Gulf Division ARRL Convention from the Biltmore Hotel—single \$4.50, double \$7.50. It is good to hear DEW on 40 meters again. GHL has returned to Texas A & M College. The Six-Meter Net in Houston had 21 stations check in on drill. It is Silent Keys for K5BQL. She passed away at the NAS hospital in Corpus Christi. ZIN is a new PAM. K5LIU is a new ORS. AQK is activities manager for the Corpus Christi Amateur Radio Club. A hearty welcome to the Beaumont Radio Club on its affiliation with ARRL. There was a nice write-up in the Kingsville Naval Air Station paper (*The Flying K*) about the station's amateur radio club. K5HGP has a new SX-101 and a three-element 10-meter beam. NXZ has been working DX on the low edge of 80 meters with 75 watts. The 7290 Net had 44 sessions, 1148 station check-ins and 587 messages. The STS C.W. Net had 26 sessions, 229 station check-ins and 238 messages. Fellows, it is time to plan to attend the ARRL West Gulf Division Convention in Oklahoma City on July 25, 26 and 27. Traffic: (Mar.) W8PH/3 298, W5EGD 224, UMY 206, NXZ 174, KJ5C 104, W5ZIN 85, FCX 66.

CANADIAN DIVISION

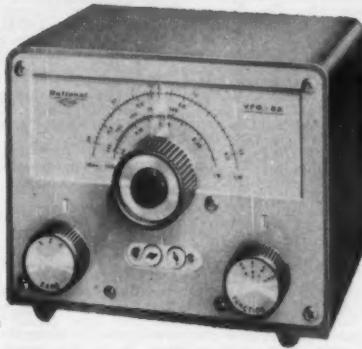
MARITIME—SCM: D. E. Weeks, VE1WB—Asst. SCM: Aaron Solomon, IOC, SEC: AEB. Al reports that the former NBAREC Net has been changed to the Maritime AREC Net and meets at the usual time (1830 Wed. on 3790 kc.). Field Day competition will be keener this year with more clubs making plans for participation. The Maritime Keyers' Net (2630 kc. daily at 2000) ties in with the Eastern Canada and Eastern Area Nets and provides an excellent outlet for long-haul traffic. Maritimers are saddened by the passing of two well-known amateurs. FG and SL, PZ is the second to make the WAZ Honor Roll. HD and DQ have joined the s.s.b. group while TA has defected to a.m. while operating /MM with a Lysee rig in his boat. WL attended the IRE Convention and S.S.B. Dinner in New York. Congratulations to HY, who recently passed his A3 exam. ZM has a new five-element beam for 6 meters. OD is now active on 6 meters. A snow and sleet storm disrupted communications on the South Shore of N.S. on Apr. 2. Communications during the emergency were handled by MA, VN, LB, ABJ, LG, IR, OC, ADH, FM, AAR and AA. Traffic: VE1BY 133, ADH 79, FQ 47, PZ 39, DB 32, ABJ 26, AEB 9, OM 2, BN 1.

(Continued on page 154)

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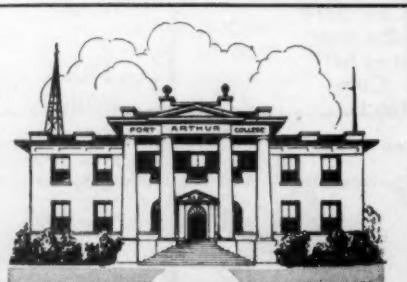
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ONTARIO—SCM, Richard W. Roberts, VE3NG—AJR has a new QTH with 7 acres for antennas EJ is recovering from a severe operation. BWK vacationed in W4-Land. GI visited Toronto during the Easter week end. NH, DZA, and AJA were mobile at Meaford at Easter. DUU was in Ottawa. The Nortown RC held very successful Annual Dinner, likewise the Scarborough ARC. The Sportsman Show in Toronto was supported by the AREC in that area. The SCM was in action once again. EC, DSM and AIB, along with HB and BBD, assisted. EAM was awarded his first BPL. VP also was very active. KM is away to W6-Land for a vacation. The Hamilton fellows, hosts for the 1958 ARRL Ontario Convention, are getting their program into shape. The North Bay Hamfest will be held June 27. KM, the SEC, reports there are 401 members in the AREC in Ontario with 96 mobiles, 67 portables and 2 portable marine. The Quinte ARC now has its new transmitter, a DX-40. AUU and NN were down with the flu. The Niagara Peninsula RC runs a Personal Column in its paper. AAS is now in VE2-Land. 2YF visited CAB, AML was awarded his 15-w.p.m. sticker recently. IA, ex-SCM, Ontario, WT, the PAM and KM, the SEC, got together with the present SCM, NG, in Burlington recently. NZ has a new QTH in Stroud. DFA is back in the hospital again. RH has recovered. HE was assistant to the SCM on the AREC organization of the Toronto Sportsman Show Ham Booth. BVF is home again after an illness. The new v.h.f. club in Ontario is doing remarkably well. The CBC recently ran a half-hour show concerning hams in Ontario. The title was "Calling CQ." Traffic: (Mar.) VE3EAM 514, DCX 263, BUR 181, NG 118, BZB 135, AUU 117, AML 114, EII 100, GI 94, NO 91, DTB 68, DPO 51, BJV 47, KM 32, RW 28, AQE 26, DH 20, EOW 18, CE 18, BOY 17, DWG 13, APL 8, DLC 7, DWN 7, EAU 7, ELC 2, SG 2.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—Nets: OSN/PQN, 3335 kc, at 1900; Quebec Fone Net, 3780 kc, at 1845. The St. Maurice Valley Amateur Radio Assn. was reorganized with AUE, pres.; UB, vice-pres.; AJD, secy.-treas.; TI, AHK and VI, directors. EK, its founder, was present at the meeting. OTs, AEK and OT (1928 vintage) also were present. AAL and ALD bought motor scooters and plan trips during the summer. AEG operates phone from Laval West. ABE will be active from Mon Repos Beach this summer. ASM got his phone ticket. ASW is mobile with a 6146. ATL will be SWL re propagation project. AUD is building a 2-meter converter. EE, the Camadair Amateur Radio Club, is very active with 75 members. The Lakeshore Club had a pleasant surprise visit by VQ4CC from Nairobi. W3BTQ/VE2 now has 122 confirmed for DXCC (165 worked). AIO needs only Zone 26 to complete WAZ. YA, QSL Mgr., reports DX business is booming. YU skeds his father, GSOO, regularly on 10-meter phone. AKT deserves much praise for an excellent job in teaching Novices. VE2s already are discussing the North Bay Annual Hamfest. AWV, Terrebonne, has a good phone signal and also is DX-ing on 20 meters. AOV, assisted by ZA and AWD, is building a new 813 rig. AKX plans to operate from Lake Manuan in Northern Quebec. OR is looking forward to the annual trek to Cape Breton, Nova Scotia. We are sorry to report the sudden death of DI, Longueil. Traffic: (Mar.) VE2DR 374, CP 54, EC 25, BG 24, ATL 15, XR 14.

BRITISH COLUMBIA—SCM, Peter M. McIntyre, VE7JT—Calling all c.w. enthusiasts: TF wants more fellows to check in on 3650 kc, between 1830 and 1930 Mon. through Fri. He has some stalwart supporters now but would like more and also would like more outlets on c.w. in B.C. We hear that APT is going Down Under on an extended trip. If he can't work them on the air he is going to chew their ears off in person. MS has moved out to QRM Alley (South Burnaby) to add to the din. The newsy paper put out by the Nanaimo Amateur Radio Club makes interesting reading. KX seems to be putting forth a good signal with his mobile which I understand is powered with a transistorized power supply. The Vancouver Club has just about polished its project for a compact 75-meter transceiver. We would like news about the DX Convention to be held in Vancouver in August. In your spare time please drop a self-addressed envelope to HR, QSL Bureau Manager, and help him clear his shelves of the QSL cards he is holding. FB has been appointed Asst. EC by APH and we presume that Ernie will try to reform the mobile gang into a revitalized unit. Traffic: KG1DT 481, VETTF 123, ALY 37, AUF 31, AIO 5.

MANITOBA—SCM, James A. Elliott, VE4IF—Amateur radio is on the upswing in Manitoba. Attendance at club meetings is going up and there is more activity among the newcomers in code and theory

(Continued on page 158)



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classes. At the last meeting of the ARLM interesting talks were given by TT and Bert Hooper, an old-timer in the broadcast field. Preparations are underway for Field Day with more interest than has been displayed for some years. Old-timers SR and NI have suffered heart attacks. GC and MS are in line for congratulations; a son to Rip and a daughter to John. KF has moved back to Winnipeg. HL still is moving. VG is busy on 10 and 15 meters with a G4ZU beam. ML was heard testing on 75 meters after a long absence. LC is back on 10 meters with a good signal. TJ has a Trapmaster in operation and TE is doing well with an NC-300 and a Viking Valiant. LJ has a Gotham beam on 15 meters. Summer static is now showing up on 75 meters with plenty of QSB and long fadeouts. Traffic: VE5YR 28, VE4GE 24, QD 22, JY 12, RB 12, EF 8, AY 7, NW 6, JQ 5, KN 5, AN 4, IF 2, JW 2.

SASKATCHEWAN—SCM, Lionel O'Byrne, VE5LU —AT is wrestling with TVI. EQ and GO are sporting new DX-40s. LM is back from Southern U.S.A. and is feeling fine. WG and QL are mobile again. NR has transmitter troubles. GG has his phone ticket and is on 75 meters with 12 watts. The Saskatoon Amateur Radio Club is holding a hamfest at Saskatoon June 28-29-30. The SARC held a c.e.d. exercise on Mar. 17. HQ has a phone ticket for 10 meters. LE was a visitor at LU and reports the new sideband rig gets out occasionally. IC is on every morning at 0645 for skeds. SW put up a new doublet. XX is building a receiver. EW's bow-tie antenna is working good DX. ES is mobile again. Traffic: (Mar.) VE5YR 30, RE 20, WG 10, DS 7, QL 4, CB 2, EQ 2.

Standing-Wave Ratio Indicator

(Continued from page 18)

of harmonics or overtones in the transmitter output.⁹ These days most transmitters are fairly clean, but the point is mentioned on the off chance that one or two readers may beat their brains out trying to match up something that is matched all the time. Most hams don't try to match this close, but there are a few persnickety ones and we want them to be happy, too.

⁹ Grammer, "Note on S.W.R. Measurement," (Technical Topic) QST, May, 1952.

Weather-Resistant Quad

(Continued from page 43)

21.4 Mc. The f/b ratio at best forward gain was 18 db. The coax recommended in various articles runs from 52 ohms to 125 ohms. It was found by trial that the s.w.r. ran 3:1 with 52-ohm coax and 2:1 with 75-ohm line. Fifty-two-ohm line with a quarter-wave transformer of 75-ohm line brought the s.w.r. down to 1.3 to 1, or better, over the whole phone band.

The 10-meter antenna uses 75-ohm coax and shows an s.w.r. of 1.44:1 at 28.5, and 1.5:1 at 29 Mc. Since 52-ohm coax is used from the transmitter through the filter, Micromatch and coax switch, 52-ohm unbalanced to 75-ohm unbalanced matching transformer (Lynmar) was used between the coax switch and the 10-meter 75-ohm transmission line.

I cannot understand or find out from anyone why the dimensions in other articles seem to work for me on 10 meters, but are way off on 15 meters. If I were to do it over again, I would make my 15-meter elements 11 feet 9 inches on each leg.

Results have been gratifying, and I think the

(Continued on page 158)



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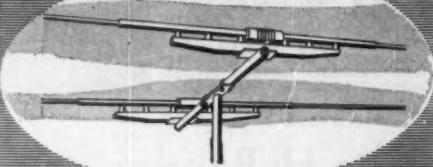
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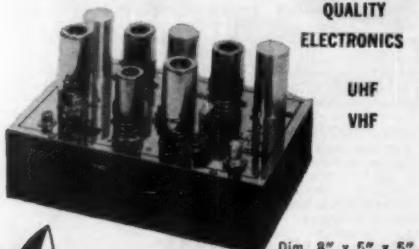
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best measure of that is the many reports saying my signal is among the strongest ones on the band. Power used is 200 watts a.m.

For those who are interested in 20-meter operation, I might mention that a third section can be added to make a spreader length of about 12 ft. 6 inches. The small end of the last section measures approximately 0.5 inch inside diameter and 0.58 inch outside. As to sag or whip, I cannot say since I have not actually tried it myself.

Sweepstakes Results

(Continued from page 54)

K6ZCL	16,698-129-44-A-17	W50HF	19,448-187-52-B-20
K6TOP	252-42-2-A-20	K6JCC	12,204-113-36-A-27
		K5DJK	4860-60-27-A-7
		K4HEW	(4 oprs)
W6NTF	37,044-204-63-A-23		98,604-505-66-A-36
W6PFE/6	(4 oprs)		
	4752-66-24-A-10		

CANADIAN DIVISION

Quebec

VE2KG

66-31-A-21

Ontario

VE3DVB

34,692-207-56-A-27

VE3ECH

20,910-170-41-A-1

Manitoba

VE4KX

51,072-307-56-A-14

Saskatchewan

VE5ZM

66,294-386-58-A-35

Alberta

VE6WW

20,405-159-53-A-11

British Columbia

VE7ZM

44,781-206-59-A-16

VE7WG

20,745-151-47-A-14

Southern Texas

K5EDM

67,045-417-70-A-28

Yukon-N. W. T.

VE8OW

275-11-10-A-1

¹ Technician Award Winner. ² W3MUK, opr. ³ K9HEM, opr. ⁴ K9DQY, opr. ⁵ K2PXF, opr. ⁶ W9ZMU, opr. ⁷ HQ staff, not eligible for award. ⁸ WIQIS, opr. ⁹ K6JQR, opr.

ARRL thanks the following amateurs for submitting their logs for checking purposes: W2a EQS JYH WPH, W3HET, W6e AM WVD, W7LKZ/4, W8e GIU WUN.

Answers to Field Day Quiz

(Continued from page 70)

1. True. Novices must observe FCC regs for their class of license on FD as well as at all other times.

2. False. Either ARRL Sections or specific indications of QTH will do.

3. False. Filament power doesn't contribute to the plate circuit power. However, the plate input to the *driver stage* must be added to the plate input to the output stage when computing the input to a grounded grid amplifier, because the driver stage does furnish r.f. power to the antenna.

4. True. Although his licensing privileges permit him to operate just on certain v.h.f. bands, a Technician may serve as logger on any band provided that (1) his code speed is high enough to enable him to keep an accurate log, and (2) the station is under the control of a higher-class licensee. Some Techs are excellent e.w. men too!

5. True. Orville is a Class D home station because his driveway and beam antenna are at

(Continued on page 100)

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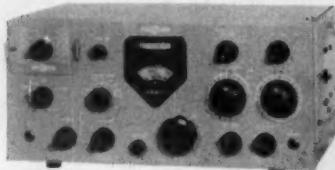
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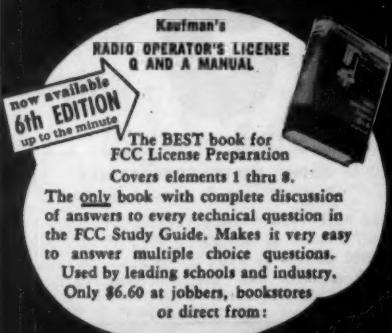
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the site of a customary fixed station location. As such, he receives a total multiplier of 1 and credit for working FD portables only. His score therefore is $50 \times 1 = 50$.

6. False. This heart-rending tale of woe is deeply touching. In fairness to the thousands who have taken part since FD's inception, however, ARRL never lists claims in *QST* when no log is on hand for inspection.

7. False. Clubs are free to use batteries but are ineligible for the 1.5 multiplier, available solely to unit-individual (Class B) and mobile entrants.

8. True. You gotta be in the field to earn any multipliers.

9. False. Although this message is in perfect form, it is worth no points to home station W9RQM. Only portables and mobiles are entitled to score credit for originating a FD Message.

10. False. Club portables can get a maximum multiplier of 3×3 or 9. See answer to question 7.



11. True. Class B or C entries with batteries and low power can earn a total multiplier of $13.5 (3 \times 3 \times 1.5 = 13.5)$.

12. True. To qualify for the independence-of-mains multiplier of 3, all radio equipment — including receivers, of course — must be independent of commercial power sources.

13. True. Despite the "slant one," W1DX/1 may be a fixed station ineligible for multipliers.

(Continued on page 162)

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* Complete Units

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Size: 4 $\frac{1}{2}$ " x 3 $\frac{1}{4}$ " x 1 $\frac{1}{8}$ " Wt.: 10 oz. 6- or 12-V Input: \$39.95 24-V Input: \$61.95

DA SERIES

Continuous operation at 45 watts. 450 volts and 225 volts simultaneous if total power does not exceed continuous ratings. Intermittent duty to 90 watts, 450 volts at 150 MA, 225 volts at 100 MA (5 min. on, 20 min. off). Positive or negative ground operation. Input (primary voltage) filtering; partial high voltage filtering provided.

Size: 4 $\frac{1}{2}$ " x 3 $\frac{1}{4}$ " x 1 $\frac{1}{8}$ " Wt.: 14 oz 12-V Input: \$57.50 24-V Input: \$79.50



Toroid Transformers for Transistor Power Supply Application

H SERIES

H-6-450-1 Input: 6-VDC. Output: 450-VAC center tapped...450 and 225 VDC from bridge rectifier...45 watts.

H-14-450-12 Input: 12/14-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...55 watts.

H-28-450-18 Input: 24/28-VDC. Output: 450-VAC center tapped...450 and 225-VDC from bridge rectifier...65 watts.

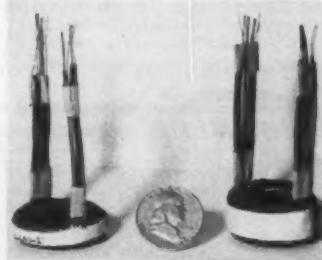
H-6-100-125-150-D Input: 6-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 100 MA.

H-12-100-125-150-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 125 MA.

H-24-100-125-150-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 100, 125 or 150-VAC. DC Output: 200, 250 or 300-V at 150 MA.

Without Encapsulation (2 ozs). 1-10 units: \$16.00 ea.

With Encapsulation (3 ozs). 1-10 units: \$18.50 ea.



HD SERIES - 2000 CPS

HD-14-225-300-2-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

HD-28-225-300-2-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 200 MA.

Without Encapsulation (3 $\frac{1}{2}$ ozs). 1-10 units: \$18.50 ea.

With Encapsulation (4 $\frac{1}{2}$ ozs). 1-10 units: \$21.50 ea.

HDS SERIES - 2000 CPS

HDS-14-225-300-3-D Input: 12/14-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

HDS-28-225-300-3-D Input: 24/28-VDC. Output: Voltage doubler configuration. Secondary tapped for either 225 or 300-VAC. DC Output: 450 or 600-V at 300 MA.

Without Encapsulation (3 $\frac{1}{2}$ ozs). 1-10 units: \$21.50 ea.

With Encapsulation (4 $\frac{1}{2}$ ozs). 1-10 units: \$24.50 ea.

600 CYCLE SERIES

14-115-1.5-400 Input: 12/14-VDC. Output: 115-V at 1.5 amp.

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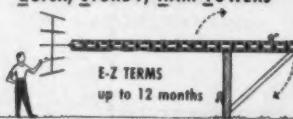
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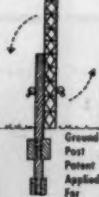
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14. False. Anyone who attaches a.c. mains to his mobile rig is no longer mobile for FD purposes. See answer to question 22.

15. False. W8QAV/Mobile handled all kinds of traffic: 69 QSOs + 25 points for his FD Message + 26 messages received + 26 messages relayed = 146 points before multipliers. $146 \times 13.5 = 1971$ points.

16. True, but the front seat of a Model A can get awfully crowded!

17. False. There could hardly be six transmitters on the air simultaneously with only five available.

18. False. Remember, traffic other than FD Messages (as defined in rule 9) may have been handled. Such work would not boost the W1EH/1 score above 433×9 or 3897 points.

19. True. *Control locations* for equipment operating under one call must lie within a 1000-foot diameter circle, but antennas may be at any distance.

20. False. A given entry receives credit for a consecutive operating period of 24 hours. VE1OM/1 can thus earn a maximum of 240 QSOs.

21. True. It is not a FD Message because it is not addressed to the SEC or SCM and the text does not state the number of AREC members. Just for fun, see how many other boo-boos you can discover in this message as received at ARRL.

22. True. Rule 4 reads: "Mobile stations are complete installations including power source and antenna, mounted in or on vehicles and capable of being used while in normal motion." The 160-meter zepp reclassifies W9MFY/9 from mobile (Class C) to portable (Class A).

23. True. TCDRA is an emergency-powered home station because it is not at a site away from customary fixed-station locations. Since Class D participants receive no multipliers, TCDRA can score 250 points at best.

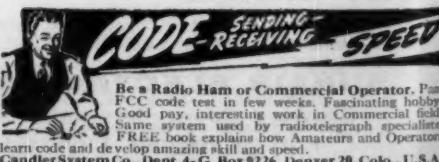
24. False. This was a unit-individual setup until the third operator sat in, whereupon it automatically became a Class A group ineligible for the battery multiplier.

W3EIS/3's score is $650 \times 9 = 5850$ (not $650 \times 13.5 = 8775$) points.

25. True. Compute LARA's mobile aggregate as follows:

QSOs	Tfc	Mult.
W1CUT	20 + 25 = 45	$\times 13.5 = 607.5$
W1FXK	25 + 1 = 26	$\times 9 = 234$
W1ICP	30 + 2 = 32	$\times 4.5 = 144$

985.5



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I.A.R.U. News

(Continued from page 82)



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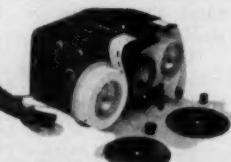
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YL-OM Contest Results

(Continued from page 81)

K5JCC	0	6	68*	KP4KD	6	6	45*
K5ID	5	5	31*	SM7CAB	2	2	5*
W5MPE	2	2	5*	OH2RD	1	1	1*
				VE2AQO	20	11	275*
K6SXKA	45	29	1,631*	VE2IL	13	9	148*
W6JVA	51	27	1,377	VE2AWR	0	7	78*
K6CQM	23	14	403*	VE3DYJ	21	13	273
K6RFT	15	8	150*	VE3RN	14	11	193*
K6LZU	6	6	36	VE3CKR	10	7	88*
				VE3ENL	0	7	79*
W7ESN	16	13	260*	VE3DLS	7	6	53*
W7TDT	19	13	247	VE3DDU	8	4	40*
W7FKF	7	6	53*	VE4SX	10	11	261*
K7BSR	7	5	41*	VO2NA	16	11	176
W7BLH	5	5	25				

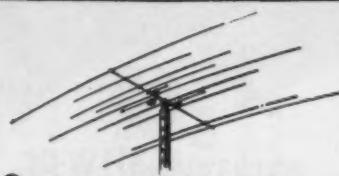
OM PHONE

W8FNI	46	28	1,610*	W1NEP	72	35	3,150*
W8AQ	49	26	1,593*	W1FPH	45	29	1,631*
W8QHW	42	26	1,313*	K1DLQ	49	27	1,321*
W8BHV	43	22	1,183*	W1GKJ	41	25	1,281*
W8IBX	38	24	1,140*	W1BAB	43	23	1,236*
W8VWU	37	21	971*	W1AIF	46	20	920
W8YGR	35	26	875*	W1TTI	43	20	860
W8KPL	30	18	675*	W1NLC	19	14	266
W8OCA	33	18	594	W1NWL	13	11	179*
W8UPA	27	17	459	W1LQJ	12	7	105*
W8PYX	26	15	300				
W8KTR	17	13	276*	K2DSW	63	31	2,441*
W8AYV	16	8	160*	K2MWK	39	23	1,121*
				W2MCO	37	22	1,017*
W9LNQ	48	27	1,620*	K2TSW	30	21	788*
W9BZW	47	27	1,586*	K2SIF	31	20	775*
W9DYG	45	27	1,519	W2RHM	35	17	744*
W9RKP	41	26	1,333*	W2WPH	37	16	740*
W9CHD	35	21	919*	K2GTC	26	16	520*
W9NLF	34	21	893*	W2VUM	17	12	255*
W9SZR	35	19	665	W2WVF	18	11	248*
W9YDQ	28	17	595*	K2PTU	21	10	210
W9OT/6	24	17	510*	W2CVW	13	12	156
K9DWK	26	14	455*	K2JVE	0	8	90*
K9DWG	20	17	425*	K2UUT	2	2	5*
W9GWO	20	11	275*				
K9DQL	32	19	760*				
W9GAX	25	16	500*	W3HWU	67	34	2,848*
W9RJF	26	21	546	W3BVL	50	24	1,500
K9KKM	19	12	309*	W3BST	43	26	1,344*
W9YCA	18	11	248*	W3EIW	43	23	1,236*
W9GXO	16	12	240*	W3ARK	45	27	1,215
W9GGG	10	9	112*	W3BQA	39	22	1,098*
K9IWK	8	7	70*	W3ZHQ	34	22	935*
W9BLH	8	5	40	W3QLW	34	20	850*

DL1QT	6	7	53*	W3YLL	24	17	509*
FA8CR	20	15	300*	W3BXG	24	10	480*

(Continued from page 106)

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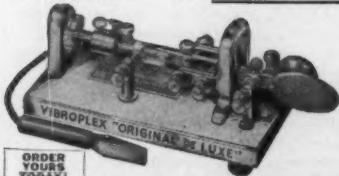
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W3FOX	27	16	422	W7GVG	17	12	194
W3JKE	16	15	240	W7KOL	4	4	20*
W3KQD	16	11	220*	W8AJW	109	45	6,131*
K4HIA	80	37	3,700*	W8BVF	45	28	1,575*
K4LGP	73	34	3,065*	W8IEC	52	28	1,456*
K4DKE	59	33	2,360*	W8OVL	34	19	770*
K4ASL	40	26	1,593*	W8FFF/3	36	17	765
K4HNC	40	24	1,470*	W8CEL/9	35	17	744*
K4RWX	44	20	1,100*	W8WNK	26	20	650
W4UJ	36	23	1,035*	W8IBX	21	14	294
W4EFY	37	22	814	W8TEY	21	14	294
K4OVE	26	15	488*	W8WWF	12	10	150*
K4IEX	21	17	446*	K8ESY	8	7	70*
W4ZCD	28	12	420*	K8IZM	8	6	60*
W4KZF	22	12	264	W8QHW	5	5	31*
W4MMD	11	6	66				
W4WZT	10	4	40	W9JXN	45	24	1,350*
W4ZPK	4	3	15*	W9YT	47	25	1,175
				W9POY	42	22	1,155*
W5VLM	80	38	3,800*	W9NLF	39	22	1,073*
W5VWV	66	32	2,645	K9BLY	33	24	792
W5ZAR	64	32	2,560*	W9VCI	32	17	680*
K5CLL	58	27	1,958*	K9DWG	24	16	480*
K5BBA	47	24	1,411	K9DWK	21	14	368*
K5EJC	53	25	1,300	W9LNQ	10	12	240*
W5YNH	36	21	945*	K9AZX	18	10	225*
K5MRQ	35	25	875	K9IGF	12	10	150*
K5HWY	42	20	840	K9DZF	13	6	78
W5ZAL	44	19	836	W9RYL	9	4	36
W5JD	33	19	627	W9EBB	5	5	25
W5PHL	20	18	450*	W9MWR	3	3	11*
K5JHD	19	16	380*	W9TOM	52	24	1,560*
W5GB	21	17	357	W9GQY	50	28	1,400
W5ULN	21	13	341*	K9ATS	45	23	1,294*
W5OUE	21	12	315*	K9AAF	40	19	950
K5EDM	19	13	309*	W9GAX	36	21	945*
K5JHD	18	11	257*	K9BWN	37	16	865*
W5KRA	16	14	280*	K9IGO	38	22	836
K5JCC	10	10	125*	W9SKF	37	17	786*
K5MWZ	11	9	124*	K9GJR	29	20	725*
W5AWT	9	9	81	W9BWW	25	19	504*
				W9BLH	28	21	588
W6FKH	83	33	3,424*	K9ENM	24	18	540*
W6JVA	82	34	2,788	K9HQX	27	13	439*
W6FGJ	73	33	3,011*	W9AQE	26	12	380*
W6PVD	54	20	1,958*	W9USP	23	12	345*
K6MPX	53	27	1,789*	W9YCA	22	11	303*
K6EIE	38	26	1,235*	K9KQY	20	12	300*
W6BVG	12	12	144	W9GBP	21	10	210
W6MTJ	11	9	124*	K9AJW	15	9	169*
K6CQM	12	5	75*	K9BLX	10	9	113*
W6OII	9	7	63	K9LFA	11	6	83*
K6XXX	6	2	15*	W9BHT	8	4	40*
				K9GBLX	26	17	442
W7SFK	104	36	3,744	KP4KD	25	16	500*
W7BCE	51	29	1,848*	VE2UN	30	19	570
W7GDS	50	29	1,812*	VE3DVB	17	12	255*
W7ESN	30	22	825*	VE4SX	19	5	63*
K7BSR	14	13	227*	VO2NA	17	13	221

The following logs were submitted for log-checking purposes only:

YL C.W. — W1YPH, W4s BLR, KZT, PPQ; K6KUP, W6UXF, W7s DIF, FRS, PY4AMX.

YL Phone — W1YPH, K2AGJ, W3MDJ, W4s PPQ, SGD; W5s RYX, Y8J; K6KUP, K9HEU, CR7LU, K7ALZ

OM C.W. — W2s CUE, HAE, HPK, IVL, UAP; K2s SEK, VVL; W4JII, W6s BIL, HWF, JH, QCQ, ZD; W7s GVG HCW; W8s BZX, TEY, WNK; K9BLY, OH3s, NY, TH; OZ7SN, VE2AJD, VE6SX, SM5BTU

OM Phone — W1s CUE, GMH, JSS, ZKQ; W2LKW, W3AKG, W4WLM, K5MYB, W8FGS, VE5JK

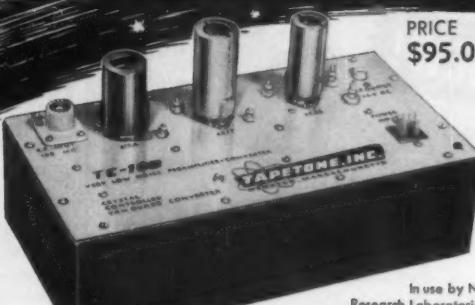
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- Power Gain: 2000 (33 db). • Noise Figure: 2.1 db.
- Image Frequency Rejection: 65 db.
- Rejection of all other Spurious Responses: greater than 65 db down.
- Output Impedance: 50 ohms nominal.
- Tube Complement: 417A/5842, 6BQ7A/6B27, 6CB6, and 12AT7.
- Power Requirements: (a) 6.3 volts at 1.3 amperes. (b) + 150 volts DC at 60 ma. regulated.
- Dimensions: 9 1/2" x 5" x 2 1/2" shielded base. Maximum seated tube and tube shield height 2 1/4".
- Rejection of Signals at Intermediate Frequency: 90 db.
- Intermediate Frequency output: 14.4 mc.
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3 Bands, 10-15-20

Gain 5.5db, F-B 20db, SWR 1.5/1

Max. element length 24 ft.

Aluminum construction

Boom 6 ft.

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POWER SPECS: B plus 125-150 volts, consumption at 125 volts, 6.2 mils; .450 amps at 6.3 volts; uses 6AH6 tube.

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DOUBLE MALE-CONNECTOR (DKF-2) for mounting relay directly onto output of transmitter. **\$1.45**

See your local electronics dealer or write direct for complete specifications.



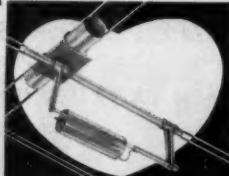
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Crystals

(Continued from page 28)

crystals in the FT-243 type holders are suitable, but those in the FT-241A type holder are not. Likewise, some crystals of current manufacture mounted in holders that are similar externally to the FT-243 have plated electrodes, as do the small metal-can type assemblies.

Last but not least, don't try to grind your crystals too close to the edges of the Novice bands. Although a crystal is a remarkably stable device, its frequency *can* be changed — by temperature, by the kind of oscillator circuit in which it is used, and by the tuning of that circuit. Stay at least a couple of kilocycles away from a band edge — and make sure you know where that band edge really is before you try crowding it!

Working WLP

(Continued from page 59)

G3KVA, SM7BPO, FF8AD, EA8BF, KL7CDF, KH6AHQ, HC1LE, OA4AS and 4X4IX. Before I had even been able to realize it, I had worked all continents, and during the same period I had also picked up another 21 states, bringing the total up to 41 states worked.

Things were going swimmingly. I was getting glowing reports from all over, the QSL cards were rolling in under the door, my bug was purring from its insulated box; and I had wonderful visions of certificates all over the wall of the shack: WAC/WLP, WAS/WLP.

I had a barrow full of DX cards, and I was beginning to firm up a beautiful vision of the DXCC/WLP certificate and where I would put it in the shack and the party I would have to celebrate it.

The landlord thought it was quite an accomplishment, too.

I would like to amend the qualifying rules for the WLP certificate to include: "An eviction notice will serve in lieu of landlord's verification."

I was watching Alfred Hitchcock's program on TV the other night, and he added at the end of his play, this little gem: the perfect murder, like the perfect marriage, owes its success to not getting caught. If Mr. Hitchcock should ever present a play about ham radio, he can add to the juicy bit: Working WLP.

LOOKING FOR A TOWER?

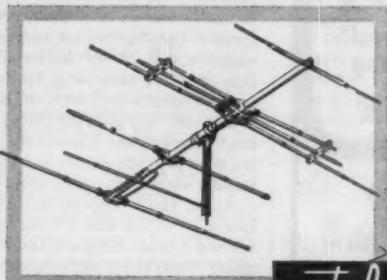
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for Feb. — or send for catalog.

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P & H ELECTRONICS, INC.

424 Columbia St.

Lafayette, Ind.

Mobile Power Unit

(Continued from page 37)

9 x 10-inch walls of $\frac{1}{8}$ -inch aluminum sheet. These walls were fastened to the sides of the chassis on which the remainder of the components were mounted. In the circuit of Fig. 3, the collectors (which are connected to the outer shells of the 2N278s) are connected directly to the negative side of the battery. In systems where this negative side is grounded, the transistors may be mounted directly on the aluminum walls. Otherwise, very thin insulating material should be used between the transistors and the aluminum walls to provide electrical insulation while maintaining maximum heat conductivity.

All of those who participated in this project² had a lot of fun and we are now looking forward toward a more compact, and efficient transmitter using transistors in at least the modulator, leaving the high-voltage supply free to deliver its full output to the r.f. section.

¹ The transformers mentioned in the text may be obtained from the following addresses:

Powertran Corp., 26320 W. 7 Mile Rd., Detroit 19, Mich.
Meteo Transformer Mfg. Co., 8877 Hubbell, Detroit 28, Mich.

Osborne Transformer Corp., 948 East Lafayette Ave., Detroit 7, Mich.

² It is interesting to note that the conclusions drawn from this independent investigation of transistor-type mobile supplies closely parallel those of the work done by WIVOR described in the April issue. — Ed.

Strays

Another newspaper gem—the transmitter described as being capable of 25 horsepower.

KN1DTR and KN1DER can't claim a single QSO marathon record, but they do seem to have established some sort of record for the amount of ragchewing they have done together over a period of time. Between Jan. 8, 1958, and April 22, 1958, they have QSOed some 135 times with a total time on the air of some 250½ hours. All operation has been on the 3.7 Mc. band.

W1BZM, a *QST* author of articles on radiological monitoring, has developed a method of identifying cancer-linked steroids by means of mass spectroscopy, thus reducing the time required for diagnosis.

A few of the gang are fed up with the "coincidence" Strays, but here's one we couldn't pass up. W4ACB is S. M. Douglas, and K4ACB is S. M. Douglas, jr.—both of the same QTH.

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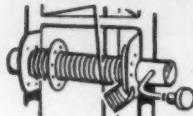
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Wattmeter, switch and built-in voltage regulator. 6
volt auto batteries. Both engine and generator
fully radio shielded. Hams report less hash than on commercial
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Item 24. Wt. 75 lbs. Be prepared if war or storms
knock out power lines.

800 Watt Plant (Item 44) same as above but with
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We make all sizes up to 25,000 Watts. Write for information.

Send 10¢ for Big New Catalog. Free with order.

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Master Mechanic Mfg. Co., Dept. I-68, Burlington, Wis.

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a \$39.90
down, without trade-in.
Cash price \$30.00
Both for the price of
the receiver alone.

1648 WAZEE ST.
ROGER'S RADIO CO. DENVER, COLO.



How's DX?

(Continued from page 87)

Ten Years Ago in "How's DX?" — An attempt is made to catalog DX hog species systematically in the introductory paragraphs of your June 1948 column. — Eighty-meter WACs are the current rage with Ws 5KC and 7KVU filing their claims. W4BRB's score of 45 appears to lead the 3.5-Mc. countries-worked race. CT3AB, F48BG, FM8AD, HC1JB, J3AAD, KS4AI, MD5KW, UA9KAA and VR5PL are among items most sought after on 80 . . . Forty is rather quiet DXwise but 20 c.w. buoyant as ever. distributes AP5B, C8YR, C2ZAC, EK1AA, FESAB, FT4AN, H1IAE, MD5PS, M16ZJ, PK6SA, UA1KEC, VS4WL, Ws 2MWF/C9 6YOT/C6 8MCF/C1 9OZW/K86 9TKK/VK9, XSV1KE, ZC6AC NJ and ZD8B favors . . . Phone on 28 Mc. still is profitable: AR8AB, FF3JY, H1IAN, HZ1AB, J2s ACS HVS SCS, KG6AW/VK9, MD5GW, PK2RK, VR6AA, XARC and ZC1AF are there. Even 11 meters comes to the party with EL5A, J9AAI and OX3GE . . . According to "Tidbits", VU2PB is back home attending to his Andaman Islands QSL backlog . . . A striking photograph of His Worship the Mayor of Coventry, England, in full robes of office — OC G6WX to the DX gang — graces our DX pages.



June, 1933

... "If successful we want to make it an annual affair" was how F.E.H. concluded his first Field Day announcement of twenty-five years ago. It was successful, apparently!

George Grammer discussed parasitic oscillations in neutralized amplifiers, a couple of broadcast engineers described some duplex portables, and James Lamb told how to convert standard superhets to single signal receivers.

Power supplies were treated in one article on transformerless plate supplies and in another article on getting transmitter power from low-voltage d.c.

A loaded antenna for restricted space was described by WIEDY. W1CDB described a tube checker and circuit analyzer.

Ev Battey reported on the 1932 Third All-Section SS Contest, in which the highest score was 56,420 points. No QSO totals were reported, but one station worked 63 out of a possible 69 ARRL sections! And this SS ran not for two separate weekends but for 10 straight days!

DX notes: Using four 01As, W6FTV worked F8BD on 3.5 Mc. ZS1H worked all continents in 2 hours and 2 minutes.

VACATION IN FABULOUS NEW YORK CITY!

—•—

VISIT THE WORLD-FAMOUS SIGHTS—

- Statue of Liberty
- United Nations
- Radio City
- Empire State Building
- "Ham Headquarters, USA" (Bring along your old gear, and save enough on a trade to pay for part of your trip.)
- Chinatown
- Ebbets Field (For Rent)
- Harrison Trade-In Center (Greatest array of bargains in like-new equipment.)

FREE!

A postcard to Bill Harrison, W2AVA, 225 Greenwich Street, New York 7, will bring you an illustrated Visitor's Guide, calendar of Summer Festival events, map, etc.

EASY PARKING

You're on the air ...

when you use the New

MOSLEY "Trap-Vertical"!

- Automatic bandswitching—10 thru 40!
- Low SWR all bands—1.5/1 or better!
- Weather-proof traps!
- Mount on ground or roof-top!

Model V-4-6
only \$27.95

AVAILABLE NOW!!!
80 M. Base Loading Coil.
Model D-4BC \$14.95

Requires no tuning! Mounts in
limited space. All aluminum
construction. Use 52 ohm feed
line. Complete with guy rope
hardware and instructions.

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ALL MAKES

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All Standard Kit Wired, Tested and Fully Guaranteed.
We do Complete Installation of Mobile and Fixed Sta-
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Like most hams, I've been tuning and adjusting transmitters and receivers for years. When a W9 told me about the boom in 2-way commercial and public-safety radio—and of the high income he was earning in mobile-radio maintenance—it seemed a wonderful business for me. So I sent for Lampkin Laboratories' booklet "HOW TO MAKE MONEY IN MOBILE-RADIO MAINTENANCE" and learned about the hourly rates . . . contract terms . . . and monthly income in that field. Now I'm in the business—and driving a new convertible! The coupon at the bottom of this ad can lead to the same results for you. Better mail it today—while it's fresh in your mind!

You can start your own mobile-radio maintenance business, too—from your own shack. With Lampkin's easy payment plan you'll need a surprisingly small investment. For your free copy of "HOW TO MAKE MONEY IN MOBILE-RADIO MAINTENANCE" send coupon today!

LAMPKIN LABORATORIES INC., BRADENTON, FLA.

XMTRS FOR 160 TO 2 METERS

TECHNICIAN - NOVICE - GENERAL

or Special Freq. 500 KC. to 160 MC.



MOD. 240 WITH MOBILE CONNECTIONS & AC SUPPLY. 1.6 to 30 mc. with plug-in coils. For Phone & CW, Novice, General, CAP. Industrial. Complete with 8 x 14 x 8 cabinet; tubes, 40 meter coils & crystal. Wt. 30 lbs. \$79.95.

80, 20, 10 meter coils \$2.91 per band. 160 meter coils \$3.60.

MODEL 130 FOR 120 to 130 WATTS — NOW \$169.50

MODEL 242 FOR 6 METERS OR 2 METERS—45 WATTS INPUT—6146 FINAL. Complete with mobile connections, A.C. power supply, tubes, xtal-Xtal mike input. Uses 8 mc. xtal or Lettine VFO. Swinging link matches 52—300 ohm antennas. Same cab. as 240. \$89.95.

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THE PREFERRED MOBILE-MAINTENANCE METERS



LAMPKIN 105-B
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Range 0.1 to 175 MC
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Price \$220.00 net.



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Range 25 to 500 MC
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you grief and time. You'd be surprised at
the shortcuts and tips listed in this book.

As its cover says, it is a symposium of
333 practical ideas for the station and
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The American Radio Relay League
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the *hy-gain* 4-Band and 5-Band Doublet FOUR OR FIVE BANDS WITH ONE FEED LINE, ONE ANTENNA



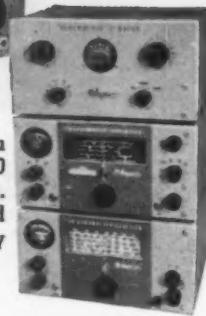
THE *hy-gain* INSU-TRAPS

Large diameter, Hi-Q trap circuits, which maintain
true isolation for maximum efficiency. Traps are light
weight (8 oz.), completely weatherproof and handle
1 KW of RF power. Trap circuit coils wound on high
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carbon activated polyethylene cover and cap. Detailed

instructions included for constructing your own 4 or
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THE *hy-gain* DOUBLET KITS

Include #14 copper clad steel antenna wire, 7" por-
celain end insulators, pressure clamps and 88 ft. of
KW Amphenol twin lead, with complete instructions.
When completed, 4-Band Doublet is 60 ft. overall
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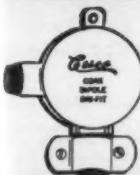


Here, in less than 120 square inches of desk space you can have a complete amateur station including the T-90 transmitter, R-9A receiver and the now famous Z match. More power and sensitivity per square inch than offered in any other package. See the H-W Bandmaster line today or write for details:

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**COAX DIPOLE
DRI-FIT CONNECTOR**



An ideal connector for dipole antennas. Install in minutes. Completely moisture proof. For use with coax cables RG-8, RG-58 RG-11, RG-59 and 300 ohm twin tubular. Has eye pull up for inverted V's. One piece aluminum alloy construction. Weighs only 2 oz.

Amateur Net \$2.95 ea.

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Insu-Traps for 10-80M, traps only, per pair	\$12.50
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VOX Model 10 for voice control with extra contacts for aux. circuits, available as accessory.

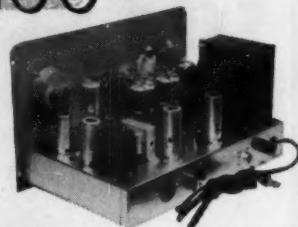
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3 Modes
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Completely Bandswitching 80-10M

Continuous band coverage 3-9mc and 12-30mc, covering the popular MARS and CAP frequencies. Designed for DSB, AM or CW, adequately protected for TVI, and adaptable for converting your present AM equipment to Sideband. Standard crystals and regular VFO can be used. Min. 35 db carrier suppression on all bands. If one sideband QRM'd, receiving operator can simply switch to other. Will drive any of the popular commercial linearars for sideband service. 3-stage RF section allows straight through operation for maximum efficiency. Internal tone generator facilitates tuning. Pi-Net output, 52-600 ohms. Speech clipping and filtering assures powerful communication punch and narrow band width. 600V power supply has ample reserve for external accessories. Provisions for Antenna Relay Control.

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Kit: \$99.50
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GROUNDED GRID CIRCUIT

Complete with well-filtered power supply, operates Class B or C, with grounded grid final. 200w input operated AM Class B, 300w DC input, or 420w PEP input, Class B linear SSB or DSB. Requires 15w RF driving power, 300w Class C for CW (18w driving power). Pi-Net output circuit covers 80-10M bands, matches loads 30-150 ohms. 52 ohm Pi-Link coupled output on 6M. Extensively bypassed, filtered and shielded for TVI.

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65 watts CW; 50 watts fone Plate Modulated

A compact, self-contained bandswitching transmitter for operation of the 6-80M bands, with built-in power supply. High level modulation is maintained. TVI-suppressed cabinet. Pi-Network output on 10-80M; link-coupled on 6M, matching into low impedance beams. New type, shielded meter. Size: 8x14x9, with the bright new "Forward Look". Works like a charm with the new WRL Globe Linear, LA-1. Write for complete information.

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Q-6

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(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others. No Box Reply Service can be maintained in these columns nor may commercial type be used solely with amateur call letters.

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(6) A special rate of 7¢ per word will apply to advertising which in our judgment, is obviously non-commercial in nature. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or organization, not for exchange, or for sale, or for repair for special equipment, takes the 7¢ rate. Address and signatures are charged for. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising so classified takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column. The 7¢ rate may apply to other rates.

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(8) No advertiser may use more than 100 words in any one issue nor more than on ad in one issue.

Having made no investigation of the advertisers in the classified columns except those obviously commercial in character, the publishers of QST are unable to vouch for their integrity or for the grade or character of the products or services advertised.

QUARTZ — Direct importers from Brazil of best quality pure quartz suitable for making piezoelectric crystals. Diamond Drill Carbon Co., 248 Madison Ave., New York City 16.

MOTOROLA used FM communication equipment bought and sold. W5BCO, Radio Hieks, 204 E. Fairview, Tulsa, Okla.

WANTED: Cash or trade, fixed frequency receivers 28/42 Mc. W9YIV, Tracy, Ill.

MICHIGAN Hams! Amateur supplies, standard brands. Store hours 0830 to 1730 Monday through Saturday. Roy J. Purchase, W8RP, Purchase Radio Supply, 327 E. Hoover St., Ann Arbor, Michigan. Tel. Normandy 8-2262.

WANTED: Early wireless gear, books, magazines, catalogs before 1922. Send description and prices. W6GH, 1010 Monte Dr., Santa Barbara, Calif.

WANTED: All types aircraft & ground transmitters, receivers ART-13, RT/ARC1, R5/ARN7, BC610E, ARN6, BC788C, ARC3, BC842. Highest prices possible paid. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

ATTENTION Mobilers! Lelce-Neville 6 volt 100 amp. system alternator, regulator & rectifier, \$45.00. Also Lelce-Neville 12-volt amp. system alternator, regulator & rectifier, \$35.00. Good condition. H. A. Zimmerman Jr., K2PAT, 115 Willow St., Brooklyn 1, N. Y. Ulster 2-3472.

CASH for your gear. We buy as well as sell. Write for cash offer or trade. We stock Elmac, Gouset, Hallicrafters, Hammarlund, Johnson, Lyco, Master Mobile, Morrow, National and other ham gear. H & H Electronic Supply, Inc., 506 Kishwaukee St., Rockford, Ill.

WANTED: Receiver R5/ARN-7, MN-62A transceivers, RT18/ARC-1, AN/ARC-3, BC-788C, L-152C, Collins, Bendix equipment, test sets, dynamotors, inverters. We pay highest prices. Advise quantity, condition, price in first letter. Aircraft Radio Industries, Inc., 70 East 45th St., New York City. Tel. Lexington 2-6254.

MULTI-BAND Antenna, 80-40-20-15-10, \$21.95. Patented. Send stamp for information. Latin Radio Laboratories, Owingsboro, Ky.

SAINT FRANCIS and vicinity. Communication receivers repaired and repaired. Guaranteed on all factory methods. Special problems invited, any equipment. Associated Electronics, 88 South P St., Livermore, Calif. W6KZ, Skipper.

RECEIVERS: Repaired and aligned by competent engineers, using factory standard instruments. Authorized Factory Service Station for Collins, Hallicrafters, Hammarlund, National. Our twenty-first year. Douglas Instrument, Laboratory, 176 Norfolk Ave., Boston 19, Mass.

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AMATEUR Paradise Vacation Spot: Livingstone Lodge and Lodge "alpine" Mascoma Lake, Enfield, N. H. gateway to White Mountains. Picnic grounds, 100 acres, eleven buildings, Main Dining, Lodge, fine sand, beach, boats, special sitter. Dartmouth golf & tennis, churches, LaSalette Shrine. Fishing, 29th year, 75 and 40 meter rig in Lobby, American plan, \$40 per week up. Children half that. Booklet. Write Al Q. Livingstone, W2QPN 12-01 Eller Ave., Fair Lawn, N. J.

"PIG-In-A-Poke"? Not if you visit Ham Headquarters, USA, and pick your choice from the hundreds of "Like-New" bargains in the world-famous Hamfest. Trade-in, new, greatest values, better than store-bought, more money overhauled. Terms: Trade-in. Send us postcard for mouth-watering photograph and price-list. For the best in new and used equipment it pays to come to Ham Headquarters, USA! BCNU, Bill Harrison, W2AVA, 225 Greenwich St., New York City.

QSLs? SWLS Finest and largest variety samples 25¢ (refunded). Calbooks (Summer) \$5.00 postpaid. "Rus" Sakkars, W8DED, P.O. Box 218, Holland, Michigan. (Religious type QSLs on request).

QSLs. Neat, Attractive. Samples 10¢. Woody's, Box 164, Amber Sta., Little Rock, Ark.

QSLs — We've printed a million! Samples 10¢. VYS QSLs, 1704 Hale St., Ft. Wayne, Ind.

QSLs. Reasonable, 3 Week Delivery. Samples dime (coin). Dick, K6GJM, Box 294, Temple City, Calif.

QSLs-SWLS. High quality, Reasonable prices. Samples. Bob Teachout, W1FSV, 204 Adams St., Rutland, Vt.

QSLs-SWLS, 100, \$2.55 up. Samples 10¢. Griffith, W3FSW, 1042 Fine Heights Ave., Baltimore, Md.

QSLs. Twenty for Dollars. Curley, 200 Buffington Rd., Chester, Pa.

QSLs. SWL's, VHF's, XYL-OM's. (Sample assortment approximately 94%). Covering designing, planning, printing, arranging, making eye-catching, comic, sedate, fabulous, DX-attacking, prototypal snazzy, unimagined, cards. Rogers, K0AAB, 737 Lincoln Ave., St. Paul, Minn. Also glamorous, pulsating (Wow!).

QSLs, Tspirit, Union, Miss.

QSLs. Plain and fancy samples 10¢. Fred Leyden, W1NZJ, 454 Proctor Ave., Revere 51, Mass.

CREATIVE QSL and SWL cards. Are you proud of your card? If not, let us print your next order. Write for free samples and booklet. Personal attention given to all requests. Bob Wilkins Jr., KN6ZMT, Creative Printing, P. O. Box 1064-C, Atascadero, Calif.

QSLs 20 for \$1.00. Curley, 200 Buffington Rd., Chester, Penna.

QSLs. We've printed a million. Samples 10¢. VYS QSLs, 1704 Hale, Ft. Wayne, Indiana.

DELUXE QSLs. Petty, W2HAZ, Box 27, Trenton, N. J. Samples 10¢.

QSL-SWL samples free. Bartinoaski W7CWE Press, Williamstown, New Jersey.

QSLs-SWLs, 100, \$2.50. Samples 10¢. QSO file cards, \$1.00 per 100. Rusrprint, Box 7507, Kansas City 16, Mo.

QSLs-SWLs. Samples free. Speier, 4615 Rosedale, Austin 1, Texas.

QSLs "Brownie," W3CJH, 3110 Lehigh, Allentown, Penna. Samples, 10¢; with catalogue, 25¢.

QSL Special. Free sample. Nat Stinnette, W4AYV, 1 matilda, Fla.

QSL-SWLs, Samples 10¢. Malgo Press, 1937 Glendale Ave. Toledo 14, Ohio.

QSLs, Sharp! 200 one color, glossy, \$4.75; Multi-color samples dime. K9DAS QSL Factory, Edward Green & Sons, 4422 Marquette Dr., Ft. Wayne, Ind.

QSLs of distinction. Three colors and up. 10¢ brings you samples of distinction. Uncle Fred, Meshoppen, Penna.

PHOTOGRAPHIC QSL-SWLs at reasonable prices, plus distinctive assortment by Mike. Samples 10¢. K6GCJ Press, 678 South Cloverdale, Los Angeles, Calif.

QSLs. Twenty exclusive designs in 3 colors. Rush \$3 for 100 or \$5 for 200 and get surprise of your life. 48 hour service. Satisfaction guaranteed. Constantine Press, Bladensburg, Md.

QSLs. High gloss, 2 colors, samples 10¢ (refunded). K2VOB Press, 62 Midland Boulevard, Maplewood, N. J.

QSLs. Samples, dime. Printer, Corwith, Iowa.

PICTURE Post card QSLs of your shack, home, mobile, etc. Made from your photograph. 1000 \$12. Raum's, 4154 Fifth St., Philadelphia 40, Pa.

RUBBER Stamps for hams, sample impressions, W9UNY, C. W. Hamm, 542 North 93rd St., Milwaukee, Wis.

FREE Samples. QSLs-SWLs. Backus, 703 Cumberland St., Richmond, Va.

QSLs. Cartoons, colors, something different. Samples 20¢. Chris, W9PPA, 365 Terra Cotta, Crystal Lake, Ill.

QSLs. Samples, dime. Eddie W. Scott, W3CSX, Fairplay, Md.

QSLs. Glossy, Samples 10¢. W1OLU Press, 30 Magoun, Medford, Mass.

QSLs. \$4.65 per 500. Free circular for details. K9EUF, Vorderberg, 1539-16th St., Rock Island, Ill.

SELL: \$-85 with built-in Hallicrafters S-meter and ant. trimmer. Wards grid, in fine cond., \$90. F.O.B. Brownwood, Texas. K5DBK, 1901 Elisabeth Drive.

VACATIONS. Modern housekeeping cabins, American plan; ham with my equipment, Lighthouse Lodge on Big McKenzie Lake, Spooner, Wis. Tony, W9HZC.

IMMEDIATE answer to your request for new listings of recommended equipment and our new complete amateur catalog. We give you a realistic deal always on all brands, new or used. Check our offer first. We deal quickly, easily and on a personal basis. Our terms tailor-made to your budget. Stan Burghardt, W9BJV, Burghardt Radio Supply, Watertown, So. Dak.

RECEIVERS and transmitters repaired by experts. Authorized factors. Wards Ham, prices. M. T. C., 239 East 149th St., Bronx, N. Y. Tel. Mo 5-1100.

DON'T Fall! Check yourself with an up-to-date, time-tested "Sure-Check Test." Novice \$1.50; General, \$1.75. Amateur Radio, 1013 Seventh Ave., Worthington, Minn.

KW5-1, \$1400; W3DZZ Beam, \$100; Gonet 66B, \$150. W. Boyce, W2HRI, Tel. N. J. DE 4-7207; NYC, BR 9-3256.

WANTED To buy: Collins 32V3 and Collins KW1 transmitter. Will pay cash, but equipment must be clean and in good cond. Prefer to buy from some one in New England so that equipment can be inspected before purchase. Bob Anderson, W1LB-A, 428 Central Ave., Milton, Mass. Tel. Bluehills 8-9337 evenings.

MOBILE Batteries, Vito-Plate Special Service Types, 6 and 12 volt, for all cars. Used by Police and Fire Departments. Free data. Cornell Communications, 1340 Ford Rd., Cleveland 24, Ohio (Paul, W8EWF).

SELL: HR6050TI with A,B,C,D coils, \$245. Send for list of parts for swap or sale. M. Marshall, 455 Washington Ave., Dumont, N. J.

TWO-WAY Communications, Mobile, Industrial, Aviation. Free catalog. RCE, 520 S. Virginia, Reno, Nev.

WANTED: Unused electronic tubes, commercial gear, lab test equipment and components. Will pay cash or swap for choice ham gear, etc. Tubes for Barry's "Green Sheet", shock full of bargains in ham gear, tubes, relay racks, transformers, etc. Barry Electronics Corp., 512 Broadway, New York 12, N. Y.

HAM Licenses, Resident courses, Novice and general classes, 3 evenings weekly, Delephant Institute, 117 East 11th St., NYC 3, GR 3-6900.

"THE Saga of Telegraphy". LP recording & brochure. Historical. \$3.75. Ralph Graham, W4RJX, Box 3556, Arlington 3, Va.

GLOBE-CHIEF, excellent condition, \$40; Knight VFO, \$20. Oscar Kaelin, W2AKN, Rd. 2, New Paltz, N. Y.

COAXIAL Cable, 53 ohms, 100 ft., \$4.35. Postpaid. Satisfaction guaranteed. Van Dick, Riverlawn Drive, N. Y.

SSB - Latest diagram, template, 3 xtrms, disc ceramic & mica condensers, coils, L1 thru L7 for "W2EW Special" (Mar. 1956 QST). \$10.95 postpaid. A. Vitale, W2EWL, E. Glen Rd., Denville, N. J.

"416B Owners, brass mounting plate, machined 3.4 - 40 hole, \$2.50. Robert B. Flint, W9YBV, RR #2, P.O. Box 290A, Bridgeport, Ind.

VR6TC QSL to W4TAJ with self-addressed envelope.

CALL plates, Deluxe 8" x 1", black phenolic laminate with engraved white letters. Only \$1.00 p.p. Polished plexiglass base. \$1.00 extra. L. & J. Products Co., P. O. Box 122, Downers Grove, Ill.

FREE Flyer, DX QSL Radio Coop., Box 5938 Kansas City 11, Missouri.

CODE Tape wanted: Will buy or rent code tapes for TG-34-A code keyer. N4JSN, Paul Hoffman, 1733 Kalmar Rd., N.W., Washington, D. C.

HARCO'S in Sandusky, Ohio, for your best deal in Ham Gear, National, Hammarlund, Hallicrafters and WRL Globe transmitters, Hy-Gain and Mosley beams, 1725 Columbus Avenue.

CANADIAN NS-300 for sale, 16 mos. old; in excellent cond., \$425 cash, no deals or swap unless you can throw in the XYL to boot! HI! G. McKendry.

PANADAPTER, New Model PR-1, only \$99; brand new tubes: 807s, 812s, 826 (each), \$1.50; 809s, \$1.75; 6146s, \$2.95; AR-22 rotator, \$12; Morrow 58R-1 converter (10 thru 80), \$29; Mosley 20-meter, 3-16 beam, \$19; B&W 72 ohm Matchmaster (SWR Bridge-dummy), \$19. All in good condx. K2HKK, 48 Thatcher Ave., Buffalo 15, N. Y.

WALKIE-TALKIE (pair), wanted. Write Dave Smith, K2CHS, 54 Butler Rd., Scarsdale, N. Y.

THREE BC645s, \$12.50 each; two RT-27/RPG4s and one DZ-2 recvr, \$7.50 each. All unused in exc. condx. Johnson Adventurer with two xtrals, \$45. All F.o.b. Atlanta, Ga. Swap for DX-40, DX-100 or 15, 20 meter beam equipment. W4FVS, 2145 Brookview Dr., N.W., Atlanta, Ga.

FOR Sale: Thordarson 200 watt, 300 mil modulation xfrm, Pri. 8,000 sec. 2500/10,000, \$20; Thermador 300 watt, 300 mil mod. trans., pri. 6,000 c.t., sec. 2300/6,000, \$15; tubes, new. Elmas 250T, \$20; two HK254s, \$25; G-E 814, \$10; two 811As, \$7. Jim Moran, K5HTB, 574 Lively Dr., San Antonio, Texas.

SELL: 75As with Universal Prod. detector, \$325; Sonar SRT 120P and VFO \$125; Morrow 5PR with N.J. \$30; PE103, \$20; Jones Matchbox, \$25; 250 watt, 250 mil mod. trans., \$20; 20 watt, metered, \$10; \$20. Anyone willing 75A? Harry Taubin, W2GQW, 731 Gerard Ave., Bronx 51, N. Y.

4-400A, 4-65A, 4X150A, 813. I have these tubes and am looking for 50W MultiMatch output modulator. Anybody for a swap? W1GPY, 33 Bacon, Biddeford, Me.

FOR Sale: SX-71 with 15-meter band, \$125; Communicator 1 6v.-15v., \$125. Both like new condx. Joe Michael, W2MNR, 80 Birch Lane, Woodmere, L. I., N. Y.

NEW Type Telrex 6EL10, \$120; 5EL15, \$125; 4EL20, \$135. Crating, freight prepaid U. S. Best condition. Robert F. Tilton, Stors, 222 So. 15th St., Omaha, Nebraska.

SELL DX-20, \$30; AR3, \$25; QF1, \$8; SG8, \$15. All in gud condx. F.o.b. Pawhuska, Okla. J. E. Turner, W5VVO, Box 682.

NC-98 for sale, with matching speaker, in fine condx: \$110. Also have DX-20 with key and 5 pair xtrals, brand new, \$40. KN2DVI, 48 Club Drive, Roslyn, L. I., N. Y.

L2V Communicator II, \$180; Ranger, \$180; Matchbox, \$45; Johnson Low Pass, \$10; Webster model 7 wire recorder: \$40; Sniperscope, \$50. W6UGL, 4411 Newton, San Diego 13, Calif.

RECEIVER Wanted: BC-348, BC-224, BC-312 or BC-342, E. Overbay, W9GFB, 834 Garfield St., Burlington, Wis.

YOUR Kits wired: Please 20% of equipment price. Write Alan Wilcox, W3DVKX, 65 N. Church St., Carbondale, Penna.

SALE: Globe King 500C \$550; 400A Final, push to talk 160 thru 10 SSB input. Will deliver 150 miles. Richard Lindquist, W1QBI, Atkins St., Middletown, Conn.

130 Good tubes, \$20 or 30¢ each. Send for list. Key, K4MDF, Dahlonega, Ga.

FOR Sale: Hallicrafters SX-99 with matching speaker, in exc. condx, one year old. Price only \$120. Write Harry Berger, 88-30 199 St. Hollis 23, L. I., N. Y.

SELL: Hallicrafters HT-9 and HT-4-B (BC-610-B) transmitters; BC-614-D speech amp; Messner EX sig. shtr; Riders manuals, Volumes 1 through 14, Ashod Hoysepian, W6EBM, 741 Swanton Dr., Sacramento 18, Calif.

HALLICRAFTERS S20R recvr with Q multipe., best offer over \$45. Aluminum boat 14" and 5 h.p. Johnson motor (like new) will trade. Delivery 50 miles. Inquiries answered. K2IQI, Box 628, Lake George, N. Y.

WANTED: HQ-10, HC-10 or SX-101, W2TWK, 34 Eagle Lane, Farmington, L. I., N. Y.

RANGER - Excellent condition, latest model, time sequence keying, \$200. 8-201 receiver, including Heath Q-multiplexer, \$45; Monsey 203-2 three element 20 meter vest-pocket beam, \$45; CDR Model AR-22 rotator and indicator, \$20. Instruction manuals for all items. F.o.b. Nutley, N. J. J. Groce, W2HZD, 45 Joerg Ave. Phone NU 2-0766.

SELL: 375 watt transmitter, 42" enclosed rack, TVI filtered, Millen exciter final, Kenyon transformers. Modulator has own supply. Prefer to sell locally. Pictures available. First \$200 takes it. Val Martin, W2UYI, MO 5-7195.

DX-100, new condition, very little use. First \$150 takes it. Will ship prepaid. W4LKP, Bowling Green, Va.

FOR Sale: Viking II and VFO, used less than 50 hours; Johnson Lo-Pass filter and D-104, Going SSB, must sell. Asking \$250. Best offer over \$225 takes it. Local sale preferred. Harv, K2CJP, Floral Park, L. I., N. Y. F1 7-8651.

FOR Sale: Complete station: NC-300 receiver with xtal calibrator, 100 watt modulator with 813 final and extra parts; 30 ft. tower with cubical quad antenna. \$600 takes all. K5KTC, 605 Dakota St., S.E. Minneapolis, N. M.

SYLVANIA FM AM signal generator, 80 kHz to 60 Mc fundamentals; sweep width 30 Kc to 30 Kc; 400 cycle, zero to 100% A.M.; step and decade attenuators; r.f. meter; 6 tubes plus rectifier and VR; operating manual. \$35. L. M. Freq. meter and power supply; See original calibration book: \$75. K2IJC, 24 Wood Ridge Lane, New Canaan, L. I., N. Y.

KITS assembled, wired and tested promptly. Our charge 20% of kit price. Experienced in all types of amateur equipment, instruments and ham radio. Partly wired kits same price. Finest checking equipment. Also equipment designed and built, factory standards workmanship. Has kits sent direct to us. Surplus gear converted. (Licensed ham since 1924. Ex W9AXJ). Money back guarantee. K6KJX, L. P. Jackson, 645-A Marshall Ave., St. Louis 10, Mo. Tel. WOodland 2-2048.

KW Thordarson MultiMatch mod., driver, filament xfrm, 806s; KW Thordarson Stander pwr supp; B221, pwr supp, modulations; over 400 copies QST, CQ, Radio, in excellent condition. \$25 for the lot. W881, 287 Philip, Detroit 15, Mich.

Solid State New Melones 150-watt pi-network rotary inductors, \$24 each. National NPW-O gear driver with 6 gang capacitor, \$2.75. FB for VFO, receiver, etc. F.o.b. Joe Harms, WIGET, Palastraw, N. H.

WANTED: Ranger or Navigator, also Courier or Thunderbolt, factory w.t. no modifications. Also SX101. I. N. Johnson, W9CPP, Luverne, Minn.

KILOWATT CLASS B: one enclosed rack has B&W power supply and oscilloscope monitor. Complete with all tubes, meters, relays and controls. Requires over 75 watts of exciter to operate. Professional appearance. In exc. condx. \$224. Fair Elmer, \$250, new. \$30. 50-250T, new, \$19.50; pair 813 used, \$9.50. 3BP1, new, \$1.50; T-17 mobile mike, \$1.50; B&W coil ferrules HCL, \$5.95; BTEL, \$4.95; BTCL, \$4.95; Kilowatt power supp. complete, \$29.95. Will trade. Want HI-FI loudspeaker and FM tuner. H. G. Price, W4LIL, 340 Ayr Hill Ave., Vienna, Va.

SALE: Viking Ranger, \$145, 108 with QT1, \$100, both in excellent condition; SS-75s, as is, \$50 each. Electronic Engineering Co., Wabash, Ind.

NATIONAL NC-83, rack & panel. No shipping. Local deal only: \$110. W2JSW, 316 George St., Babylon, L. I., N. Y. Tel. MC 9-4452.

CANADIAN: 75A4 with 2.1 and 6 kc filters, 1957 model. \$675. Want cheap receiver no part payment. Also new P4600GG 575 watt linear, per 20A, \$250. W. G. Budd, 428 7th, Saskatoon, Sask., P. C.

SELL: Viking II with time sequence keying, Mod. 122, V. Fv, \$225; Central Electronics 81, QT1, 8C 458 VFO, \$200; Gonet G66, 3 way power supply, \$195; Johnson mobile xtrnr and VFO, \$120. Equipment in very clean and exc. condx. With all instruction books. F.o.b. K2LJU, 8 Third St., Freehold, N. J.

SWAP Mosley 10 and 15 beam, 3-element, VPA10-13 for oscilloscope or thirty dollars. W2IYR.

FOR Sale: Collins 200-1, completely TVI suppressed; 500 watt phone, single 4-100A final and Collins 75A-1 price for complete station. \$1150. Samuel S. Strauss, W2RCN, 5335 203rd St., Bayside, L. I., N. Y.

SALE: Johnson S.W.R. bridge with 0-1 Ma meter, \$8; dynamotor 12v. output, 250 and 500 V. \$12. W4W-F, 244 Parkway, Winchester, Va.

I-HRO receiver, \$50; 1-HV power supply 3000V, at 1 a., \$100; I-SW3 (dc), \$20; 1-Preamp vert. ant. with base insulator, never used, \$17; 1-Gordon rotator and 3-element, \$95. 1-KW F.A. with 806's. B&W col and cond., never used, \$30. 1 power supp 1500 V. at 300 Ma., \$25. G. Gatham, W2DOE.

WANTED: Viking II, V.F.O., gud condx, cash, write stating best price. Frederick Duff, 302 Market St., Franklin, W. Va. K8HUK.

RECEIVERS for sale: RAL with power supply, \$49; NC-120, 5 to 10 Mc, \$69.50; NC240D, \$129.50; also have Collins 316-B, \$175. Want: KP-81 or SP600. Tom Nash, M.D., W5NW, 1100N Canterbury, Dallas 11, Texas.

WANTED: Jennings vacuum variable 3000 μ uf type UCS, Cardwell 1500 μ uf variable type 2013, Weston 0-250 Ma. model, 301 bakelite case; three 4-250A tubes, Ripley Mod. 8433 blower, 21CFM, B&W TTEL turntable assembly; B&W mod. \$50. PI-tank inductor, Thordarson T21 FO7-4 5 volts, 29 amp. filament xfrm. Larry Kieber, K9LKA, Belvidere, Ill.

FOR Sale: Harvey-Well's TBS50D, all bander, phone, c.w. xmtr, operating condx B. Recorder Webster Chicago model #181-1; also 522 trans., rec. and pwr supply. All in gud condx. State price. All inquiries answered. W9ZKH, 7848 S. Kimbark Ave., Chicago 19, Ill.

SELL: 2-meter Communicator II, 6-110V with all cables, whip, manual. In great shape, not used much. 1 1/4 years old. \$150. Write or call: Nelson Friedman, 1108 Simpson St., Bronx, N. Y. Tel. DA 8-1258 or TE 8-3700.

COLLINE 75A-4, \$550; Hallicrafters HT-32, \$475. Condix perf. First come, first served. Rex Bassett, W4QBS, Box 7127, Ft. Lauderdale, Fla.

HC-348 Q. A.C., \$25; Gonet 10 meter converter, \$10; 100 watt r.f. chassis, 2-809, meters, \$10; 40 watt modulator, metered, \$15; 880-660 volt power supply, \$15; VFO-exciter, 807 final, \$15; misc. equipment. W2LKR, Francis W. Vosken, 115-71 227 St., Cambria Heights, L. I., N. Y.

SELL: T-23/ARC-5 transmitter, 100-156 Mc. Brand new, with tubes: \$12.00. H. Heden 333 Gullum St., Clinton, Tenn.

HAMMARLUND HQ150, latest model. Never used, in carton. Received for debt payment, \$255. Will ship. S. Alexander, 1104 Irving St., San Francisco, Calif.

BARGAINS: Send for list of reconditioned receivers and transmitters with new guarantee. 10% down with up to 24 months to pay. In stock, new Collins Johnson, Hallicrafters, R-10, National, etc. marine. Gossen, Elmer, Drake, Cetron, Electronique, B&W, Hy-gain, Mosley and Gotham beams. Shipped on approval. Write Ken-W9ZCN or Glen, W9ZKD, for your best deal. Ken-Els Radio Supply Co., 428 Central Ave., Ft. Dodge, Iowa.

TUBES: New, postpaid: 4X150A, \$15 each; 813s, \$6 each; 5894s, \$18 each; 622s, \$15 each; 3B25s, \$6 each; 829-Be, \$6 each. Allan Wulf, Mount Vernon, Maine.

CASH: For factory-wired Johnson Valiant and/or Ranger. State condx and price. Col. E. W. Sears, U.S.A. (ret.), 4725 Bridle Trail, Santa Rosa, Calif. All letters will be answered.

MOBILE Whip antennas: base, spring, whip and gasket. List \$22, used but excellent: \$5.00; mobile dynamotors, 6V input, 645V 155 Ma. output, \$3.00; coax, 6' to 10' and longer; remote control, 50 watts; 85' 4-wire remote control beam, dynamic, \$35; commercial ship antenna, 75'; electronic megaphone, \$25; wanted: Lamplink Lab freq. meter. Broadcast transmitter. Gonet Communicator. Higley 82 Lower Main St., Matswan, N. J.

SELL or Swap for 0-27 Railroad Gear, Viking I, coax relay, balun, xtal mike, 2-meter converter, GF-12 navy transmitter, prefer local dev. F. Yates, K2DZS, 58 Wayside Lane, Trenton, N. J.

SELL: Station, including SX-90, C.E. Q-multiplier, Globe Chief xtal, key, earphones and antenna. Everything in A-1 condx. terms: best offer over \$175. Separately, make offers. KN2IKB, 312 First St., Scotia, N. Y.

COLLINS KWS-1 transmitter and 75A4 receiver. Both in excellent condx. Will sell both for \$1850 if picked up at my QTH. J. V. Heuer, 2475 Grande Ave., S.E., Cedar Rapids, Iowa.

GONSET Tri-bander 12 volt \$22; 12 volt dynamotor 1000 volt, 350 Ma., \$20. Bill Allent. Rte. 5, Athens, Tenn.

SX-101 Like new, in original packing. \$325. W2KIT, 29 Wymnor Road, Scarsdale, N. Y. Tel. SC 5-5493.

SELL: Viking II with Collins VFO, TVI filter, suppression and 80-40-20 ant. for \$250. E. O. Johnson, 231 Snowden Lane, Princeton, N. J.

WANTED: Used SX-28 cabinet, gud condx. Kent Hughes, 113 Kukule Rd., Kaliua, Oahu, WH6CRU.

WANTED: Tower, over 60 ft., crank-up or tilt-over, Tri-Band beam, rotator and indicator, antenna test instruments. Please describe fully and quote price. Stan Cley, RD #1, Burnt Hills, N. Y.

NC-300, matching speaker and 2-meter converter. Make reasonable offer. Heathkit VTV-10; Gonet 10-11, \$10. W2WFV, 255 Eastern Pkwy., Brooklyn, N. Y.

FOR Sale: Transmitter Motorola FMTU30D 152-162 Mc. FM 6V dynamotor supply easily convertible to 2 meter AM. \$25 as is. W1MVO, 7 Oliver Terrace, Revere, Mass.

NOVICE 10 mtr. 30 w. c.w. xmttr, \$10; 10 mtr. converterette, \$8.50. F.o.b. W. Deane, 910 Redwood, Oxnard, Calif.

WANTED: HRO Senior coils with band-spread. Also National Senior 8-meter. Wanted: Old HRO or Collins receiver. Emmet C. Weber, 31 Wocolt Rd., Chestnut Hill 67, Mass.

6-METER Gonet Communicator II, in original carton, 12 volt system, \$185; NC-98 with matching speaker, \$100; Simpson 260 volt ohmmeter, \$20. These items cannot be distinguished from brand new. 6 meter 4-element Gonet beam, brand new, with C.D.R. rotator and indicator. David Ojala, K2RBQ 55-43 25st St., Little Neck, Queens, N. Y. C. Tel: BA 2-9202.

WANTED: National receiver 1-10 with or without power supply. I have for trade 35m. Goldine Manumatic projector 300 watts. Vg condx, \$25 value. W2QRL, 41 Griffiths, 30-82 85th Place, Woodside 77, L. I., N. Y. Tel: PI 7-1549.

SX-100 R-46B, both. Best offer. G. Macmillan, 37 Sherwood Ave. Madison, N. J.

FOR Sale: SX-100 revr HT30, exciter, HT31 amplifier (Hallicrafters 500 w. SSB station), like new, little used and in A-1 condx and original carton. A. M. Krause, 220 York Rd., Jenkintown, Pa.

FOR Sale: 500 watt all-band 4-125A final. VFO controlled, complete except for speech amplifier. \$150. W2ALM, Harvey L. Newman, 91 Falmouth Pl., Alberton, N. Y.

COLORADO This summer? View Haven Motel, five miles south of Denver. On U. S. 55, the road to Colorado Springs. A real ham haven. high altitude Ham with my equipment! Mel and Edna Malley, W9PSRU, U. S. 55, Littleton, Colo.

SELL: BC 224-D receiver, same electrically as the 348 series, with power supply, \$65. W2E0V, 222 Graphic Blvd., New Milford, N. J.

SELL-Trade: 3 new supplies 1000V/.300 Ma., including new 866's, \$30 each; new 125 watt push-pull 6146's plate modulator, \$35. Several new 20 and 40 watt plate modulators, \$15 and \$18 each. Dual vibrapack 6-400V/.120 Ma., \$10; 5 new supplies, 750V/.250 Ma. 6.3V, \$15 each; 1950 Ford radio, \$10. Stan Zuchors, W8QKU, 2748 Meade St., Detroit 12, Mich.

DESIGNED Display cards, 8 x 11, 4, \$1.00. R. Wiegand, K2NEYB, 882 Balfour St., Valley Stream, L. I., N. Y.

SALE Local area perfect NC300, spkr, calibrator, \$325. W2GXK, 4 Wilson Road, Valley Stream, L. I., N. Y.

SELL: Like new, NC-98, \$110, with Heath Q-Multiplier and speaker. \$120. Paul Van Nostrand, 1304 Stewart Ave., Bethpage, L. I., N. Y.

SELL: Heath DX-35 xmttr with Knight VFO, both in excellent condx. \$80. W2ZYX, Les Margaret, 147-56 69 Rd., Flushing 07, L. I., N. Y. Tel. Liggett 4-5615.

NEW Mercury outboards and boats. Will take ham gear on trade. Write: Boyd Rester, K9IMO, Boyd's Marine Shop, Clinton, Iowa.

MOBILE Gonet G77 xmttr, G66B revr with all-band whip, spring and bumper mount, \$400 or best offer close. Will ship anywhere. P.O. Box 181, Alexandria, Va. K9RMW.

FOR Sale: Viking II and VFO with instrux manuals and spare tubes except for rectifiers, \$225 or best offer. F.o.b. Ambler, Penna. or trade for A54H and cash. Sam Santoro, 334 Railroad Ave., Ambler, Pa.

COMPLETE Station 75A4 Globe King 500B, Central Electronics 20A, Micromat 2-4, Tri-band beam, all for \$1400. Will consider part trade. Mail to boat or mobile unit. Jack Godfrey, W1ZZF, 73 Whitley Ave., Milford, Conn.

HARVEY-WELLS TBS-50D with VFO and APS-50 and APS-50 power supply, \$100 cash. Roger Mayhew, Conway, N. H.

FOR Sale or trade: Factory wired Viking Valiant, Harvey-Wells Z-matic complex speed-key w/case. ARB BX. Want 500 or more watts VFO all-band xmttr. Write: K1BRI, RFD1, Topsham, Me.

TOROID: Unchecked 80 m like new. Dollar each. Five, \$4.00 PP. DaPaul Co., 101 Starview, San Francisco 27, Calif.

NOVICES — Technicians, complete set of parts for QST articles for beginners, e.g., code practice oscillator, beginner's two-tube receiver, etc. White K-G Electronics, W1KAH, Ralph Greenberg, 37 Loring Rd., Winthrop, Mass.

METERS: Westinghouse 1/2, type KX-24, KC-24, Triplet model 420 A, two Parmetal deluxe cabinets on double dial, \$40. Free list. J. E. Whisnant, 842 23rd St., South Bend, Ind.

SELL: Heath DX35, \$50; VF1, \$17. PM1, \$14. All three, \$75. 817 Super Skyrider \$35, performs like new. Building 300 watts and new receiver. Jerry Miller, W9QON, 8414 Keystone, Skokie, Ill.

WANTED: BC221: Pay cash or trade cameras. State price and model. Charles Rotkin, W1JXD, 135 Pilgrim Drive, Norwood 7, R. I.

VIKING 500, factory wired, in excellent condition, \$600; Johnson low pass filter, \$5. W6DSP, Box 1264, Sioux City, Iowa.

SELL: Viking Valiant, 6 months old, \$325; National HRO-80 with 6 meter coil, like new, \$325. Both units for \$600. Will ship. W3LSS, G. M. Snyder, RD 4, North East, Penna.

COLLINS 75A-1, excellent condition, audio, R.F. IF, improved according Bill Orr's article. Speaker available, \$235 or best offer. W2EEJ, 821 Rutgers Road, Franklin Sq., N. Y.

WANTED: Old Call Letter license plates. KNTBZC.

BARGAINS: with new guarantee: KWS-1 (Demo) \$1,495.00; NC-125 \$139.50; S-72 \$49.50; SX-101 \$319.00; NC-98 \$119.00; NC-300 \$319.00; Lysco 600 \$69.00; Eldico TR-75TV \$25.00; Viking Mobile \$79.00; W6 151B \$195.00; Lysco 381 VFO \$12.50; Johnson Projector \$384.00; W2QRL 6146's \$10.00; Gonet Linears (2M) \$99.00; (6M) \$119.00; Horner MAR-1000 \$100.00; Globe Trotter \$29.50; Globe King 500A \$435.00; Globe King 500 \$435.00; Globe King 500B \$59.00; Scout 65A \$69.00; NEW Gonet Communicator II \$307B or \$302B \$199.00; Sonar SRT-120P \$199.00; Johnson Rotomatic \$125.00. Free Trial, terms, write Leo, W6GFQ for best deals. World Radio Laboratories, 3415 West Broadway, Council Bluffs, Iowa.

FOR Sale: Exact copy of Handbook 500 watt 813 VFO transmitter. Works perfectly, \$175. With power supplies and 4 ft. rack, \$200; Gonet Super Six an Superceiver, 6 or 12 volt, \$75; small prop pitch meter, converted and like new condx, \$25. William Barnard, 3399 Madison Rd., Pasadena, Calif.

FOR Sale: Globe King 500B, very little use, like new, \$475; 20A exciter, late model with less than ten hours use, with factory built deluxe 458 VFO, \$250. Howard C. McDonald, W8DWI, Shelby, Michigan.

BARGAINS: Reconditioned with new guarantee. Shipped on approval. Hallicrafters S38 \$29.00; S40A \$69.00; SX99 \$119.00; SX71 \$149.00; SX100 \$229.00; Viking Adventurer \$39.00; Viking II \$199.00; W2QRL 6146's \$10.00; Gonet Linears \$10.00; NC-98; NC185D; NC300; HQ129X; HQ140X; GPR90; A54; A57; PMR6; PMR7; Collins K2NWI; 75A1; 75A2; 75A4; 32V3; many other items. Easy terms. Write for list. Henry Radio Co., Butler, Mo.

SELL: FE103-A dynamotor, complete with cables, 6 or 12 volt mobile operation, \$25. R. H. Arp, 99 Mtside Terr., Clifton, N. J. W2TLC.

VIKING Ranger for sale, mint condx, with push talk. Used little. First offer over \$175. Herb Abrams, K2JEF, 31-31 267 St., Floral Park, L. I., N. Y.

FOR Sale: 3 in. D.C. meters: five 1 Ma., three 100 microamp., four 0.1 Ma., one 150 v., two 4000 v., 2 in. D.C. meters: two 1 Ma., one 5 Ma., one 15-600V. Weston, Triplet, Marion, Westinghouse, G-E. \$25 or \$60 for the lot. E. P. Sadler, 398 Slocum St., Hartford, Conn.

FOR Sale: Viking Ranger, latest model, in perfect condx, \$195. R. Roots, W2PNT, 141-48 78th Rd., Flushing 67, L. I., N. Y.

SX-101 Mark III, latest production, in orig. factory carton and used only a few hours. Must sell. \$300. W1RGX, 56 Canal St., Medford, Mass.

CANADIANS: Mobile equipment, all brand new 3 months ago: Gonet G77 with modulator and 12 v. pwr supp, \$275; Raferd automatic all band antenna, complete, with remote band indicator and control, \$375; fully automatic phase detector unit, complete, with 12 volt motor. Keeps antenna alignment permanent, \$35. Regency AT-1 transitor all band converter, \$75. Master Match M-1000 matcher, \$6. M.M. bumper mount, \$8. R. Hadfield, VE3GL, 14 Sunnyside Ave., East, Toronto 18, Can. Phone BE 3-5244.

SELL: HT-33 amplifier, sacrifice, \$620. Want: HT-32 or KWM-1, SX-101. Dr. Gordon, W2UHV, 12 No. 27th, Camden, N. J.

SELL: Heath DX-35 xmttr with Knight VFO, both in excellent condx. \$80. W2ZYX, Les Margaret, 147-56 69 Rd., Flushing 07, L. I., N. Y. Tel. Liggett 4-5615.

WYOMING Hamfest July 12-13. Ham vacation in beautiful Big Horn Mountains. For information, W7QPP.

BC-1016 Recorder. Fair condx. Highest bidder. ARRL Training Aids Section, 35 LaSalle Rd., West Hartford 7, Conn. Address replies % W1FGF.

"VOICES of the Satellites." Authentic recordings of radio signals from man's first five satellites with clear explanation of what they mean. A collector's item. Everyone prone to curiosity will be thrilled to own these. Price: \$3.95. 5 in. 10 in. LP disk. Taben Recordings, Box 224-B, Ardmore, Penna.

NOW Available for amateurs. Factory punched and drilled chassis, panels, and Boxes, ready for immediate use. Send specifications for price. Also, aluminum sheet and angle stock. Advise requirements. P. Nugent, 149 Miller St., Boston 24, Mass.

FOR Sale: 11-tube Navy receiver, general coverage to 30 Mcs. National HRO styling, excellent sensitivity, good condx. Best offer over \$75. Also Globe Chief xmtr, used 8 months, in top condition, plus antenna relay. Best offer over \$45. Ben Lechner, 105 Joanne Terrace, Garfield, N. J.

FOR Sale: 11-tube DX-10, perfect operating condx, all bands, \$65. VFO, antenna tuner, \$10 (brand new). Old Howard receiver, fair operating condition all bands, \$10. Paul Gerald, 2631 Montreal Ave., St. Paul 16, Minn.

WANTED: Full details on your club's award or certificate. Bill Clark, 8 Frances Dr., Harrisburg, Pa.

CROSBY Laboratories 67A SSB converter, \$90; General Electric YR-1 SSB adapter, \$35, both like new. Al Tumas, 6816 S. Rockwell St., Chicago 29, Ill.

SELL: Viking Adventurer, excellent, \$35; SX-24, very good, \$60; Bassett vacuum coil, 15 meters, \$7. Want: Brown Electronics recorder, or equal. MV calibration, circular or strip, single or multi-point. W1LWV, 99 Water Millinocket, Me.

SWAP: Gibson electric guitar and Gibson 5-tube amplifier for good communications receiver. W8WFV, 1753 Kensington Ave., Youngstown, Ohio.

WANTED: Hallicrafters SX-24. Advise condition and price. Local preferred. Harry Register, 25-94 42nd St., L. I. City 3, N. Y.

SELL: Adventurer with modulation transformer, \$35, 115V inverter ½ KW \$25.00. K2SHX, Bob Lieberman, 117-01 Park Lane S., Kew Gardens, N. Y.

SELL: Lycos 600 40 watt e.w. FVO ex. condx, \$55; plate modulator 20 watt w/ps \$15; AT-1, \$15, 750 volt 150 mil. pwrr supp., \$8. Dick KSDMY, 119 Coe St., Pif Tiffin, Ohio.

ALUMINUM for the ham. Everything you need for shielding the rig or building a beam. Also, complete beam kits, VHF Collinear arrays, \$14.20 up. Close-out special, ten meter beams, \$15.95. Write for listings. Dick's, W8JLJ, Cherry Ave., Route 1, Tiffin, Ohio. Successor to Radefil's.

FOR Sale: Lettine 240 and VFO, excellent condition, 40-50 watt a.m./e.w. all coils. \$70 plus shipping. Will deliver 50 miles of Wayne, N. J. L. Taneel, K2MDV, 131 MacDonald Drive.

FOR Sale: Best offer: Johnson KW with matching desk, Ranger and HT-30 exciters. All cables, co-ax relay and low pass filter. W2VCZ, Hoohokus, N. J. Tel: GI 4-3533.

PITTSBURGH Hamfest: Biggest yet! 21st annual hamfest of the South Hills Brass Pounders & Modulators Sunday, August 3, 1958. South Park Totem Pole Lodge, Contests for young and old. Swap Shop. Preregistration \$1.50. Write or call William E. Guthrie, W3LDB, 4949 Roberto Drive, Pittsburgh 6, Pa. \$2.00 at door.

ANTENNA: Mosley Tribander Vestpocket VPA 3B ex. condx. Cost \$135. Will ship F.o.b. St. Pete, 70. W4HTH, Ed Vernier, 6935 Ninth Ave., North, St. Petersburg, Fla.

FOR Sale: Viking Adventurer, Edicor AM-10 modulator, Heath VFO, \$75; Gibson Anderson, K5BHP, Rt. 3, Box 178-A, Pine Bluff, Arkansas.

TELREX 3-20-meter beam, \$65; Telex 3-el. ten meter beam, \$35; Mosley 3-20-meter beam, \$50; Spanish 40 ft. self-supporting mast, \$40; Don-Keay relay, \$5; Central Electronics 20-c. rack mount, \$17; plus C458 VFO, \$23. Factory wired. Robert Scallia, 4063 Magnolia Ave., St. Louis 10, Mo.

FOR Sale: T.C.S. transceiver, 100 watt complete with pwrr supp. and accessories, \$60. TBY, \$20. J. O'Sullivan, K1DYE, 335 Nottingham St., Springfield, Mass.

FOR Sale: 75A4 and HT32, both in original cartons. Best offer over \$535 each. Will deliver within 100 miles, otherwise F.o.b. W3KMK, Leo Korishian, 59 Church, Edgewater, Pa.

INFORMATION wanted: U.F.O. radio interference observations. Contact Gees Korchmaros, Jr., 2528 Market St., Youngstown 7, Ohio.

FOR Sale: Gonet G66 mobile receiver, late model, complete \$125 F.o.b. W9HX, 3206 W. Virginia St., Evansville 12, Ind.

MUST Sacrifice SP-400X with National speaker, for school expenses. First \$195 gets this receiver which is not surplus and has been kept in like-new condx. W4ZKS, C-106 Shawneeok, Lexington, Ky.

SELL: Collins 32V2 transmitter, V3 shielded, and B&W lowpass filter installed; \$340 predrift; VFO-4A modulator, \$75. Eico condenser checker, \$100. D. L. Robinson, W3SWV, 1600 Westview Dr., New Kensington, Pa.

HEATH AT-1 and antenna coupler, \$25, excellent. Heath Q-multiplier, \$7. F.o.b. Augusta, Ga. Richard Weaver, 2234 Darlington Drive.

SWAP: 12 gauge Winchester, Mod. 12 shotgun; good condx, original cost \$135. for 10A or 10B. K9HJP, Greencastle, Ill.

JOHNSON KW desk and Ranger, one year old, \$1200. F.o.b. Johnson 500, new, \$750 F.o.b. Sorry, no shipping on KW. Wanted: Telex 10-m beam with balun. W9KYE.

4-1000A \$30; 4-1000A, air system socket, chimney, heat radiating connector, \$60; Blonder-Tongue CA-1 all channel booster lists \$85, sell new \$35. Hi-Fi equipment used, excellent. Craftman 15 watt amplifier, C-500, \$40; Heathkit preamplifier \$19; both \$55; Fairchild pickup, diamond, and transformer \$25; Livingstone binaural arm cost \$35 sell \$10; Jim Lansing 725 ring tweeter, N-2500 crossover trans. and rheostat, \$30; Electrovoice SP-15 speaker and \$100 professionally built blond enclosure \$100. Will trade toward Acoustic Research AR-1W, Dynakit, Ranger, DX-100 or what? Sam Thompson, McConnell Hall Moscow, Idaho.

AUTOMATIC Garage Door Opener, Alliance CT for curved track sectional door, latest model, new, complete, with xmttr, revr, track, operator, instructions and warranty card worth \$75. Xtal controlled 16-mc. Converter, \$6.50; ant: crank-up tower. Alprodec tower sections. High power linear, amp w/pa. J. M. Hofer, K1CQO, 24 Cherry Rd., Framingham, Mass.

ELENCO PA-400 SSB 400 watt amplifier, \$100; Dumont #274 'scope, \$45; Harvey-Wells VPS-50 vibrator supply \$15/300/200 Mc. \$15; VFO, \$42.50; 6V, 12V, 220V, 275V, 280V/200Ma power supply, \$15. All like new. W1RMS, 198 Euclid Ave., Waterbury, Conn.

TELREX (20M-56-149) 3 el. 20 meter beam for sale. In excellent condx. Ready to ship. Any reasonable offers? Paul Bittner, Concordia Seminary, Springfield, Ill.

DON'T fail to send for free List. Selling complete rig and other miscellaneous equipment. Bob Doersam, 3807 Mound Way, Cincinnati 27, Ohio.

HR060, matching speaker, xtal calibrator, NBFM adapter, A, B, C, D, E, F coils, \$425; Telecraft 220 Mc. converter 14 Mc. I.F., \$20; Hallicrafters C-100, 12 volt, \$12; G-100, 12 volt, \$15; G-100 2-mtr linear ampt., \$75; Elmac P529 power supply for AF6 with connecting cord and plug, \$35. Equipment clean and used but little. Dick Hill, W9TGN, 2116 Ewing Ave., Evanston, Ill.

FOR Sale: 32V3, perfect electrically and mechanically, \$500. W2BHZ, George Hudson, R. 2, Pine City, N. Y.

FOR Sale: SX101, latest model, like brand new condx, make a reasonable offer. W1OHC, 228 Union St., Franklin, Mass.

LINEAR Amplifier (2000 watts PEP), two 4/400A parallel, made by Adams Electronics, best of components. Elmac air sockets and condenser vacuum tubes, four meters, completely shielded and TVI suppressed, \$150. C-100, 12 volt, \$15; G-100, 12 volt, \$15; perf. condx. Harvey-Wells TBS-50A less power supply, \$45; Monistone 3' (see April 1954 CQ), \$20. Send self-addressed stamped envelope for list. Al Warling, W2CFT, Box 483, Lake Ronkonkoma, L. I., N. Y.

HAMFEST June 8th Southwest from Ottawa, Illinois, on Illinois Route 71 at the La Salle County 4-H Home and Picnic Area. Same place last year. Advance registration accepted if in our hands before May 30th. Advance registrations \$10. At the gate \$15.00. A nice all-day affair for Midwest Hams and their families sponsored by The Starved Rock Radio Club. Contact W9MK8, G. E. Keith, Secy, RFD #1, Box 171, Oglesby, Ill.

S.S.B. Transformers identical and exact as used in W2WEU exciter (see QST March 1958) Brand new for \$4. No C.o.d.s. Please. S. Tucker, W2H1Z, 51-10 Little Neck Parkway, Little Neck, B2, N. Y.

SELL: Holmes Institute (CREI) Course, "Practical Techniques of Supervision & Management" 41 latest lessons, plus 10 extra lessons, all textbooks. Cost, new, \$150. First \$8 takes it. W3JEP, 2013 Riviera St., S.E., Washington 21, D. C.

SELL KWM-1. Perfect, brand new condition: used very little. Less power supply or accessories, \$725 or best offer. Will ship prepaid. W9CHM, 2918 Fifth St., Boulder, Colo.

SELL Globe Chief 90, \$45. Jack Ashley, K9KHZ, Tonica, Ill.

NC125 receiver, used little, \$115; RCA W84B Micro ammeter, new, \$35; 2 AR4Cs, 1 complete and 1 for spare parts, both \$25; Gonet 10 M. converter, \$15; Instructional code machine, 10 tapes, \$12; 500 ft. 8421 Belden wire, \$15; pair of balun coils \$5.00; DC decade counter 6-1000, \$15; 12 volt grid driver, full set of coils, \$40; Cleaning hook, other items: tubes, transformers, condensers, 201 Weston meters, etc. Want Elmac mobile equipment. W1WZT, Williams, Clinton Rd., Hewitt, N. J.

WILL sell or trade mobile Gonet Twins G66 and G77. Need late model receiver. Carroll Curb, K5VFK, Monahans, Texas.

WILL exchange the following: New, never used: Retina III-C camera with telephoto lens, wide angle lens, optical multiple finder. View universal, special lens case, supplementary lens, frame finder and film melt. \$45; G-77A transmitter with universal power supply and installation kit. K4TOG, 2004 Box 4, Brunswick, Tenn.

NEED DXCC or WAS confirmations? International Reply Paid QSLs will help! \$25, \$1.00. Sample free. Hart, 467 Parke, Birmingham, Michigan.

KWS1 and 75A4, new condition, in original cartons, selling due to interest in sports cars. Sacrifice. \$1950. W2LAY, 6123 Ellsworth St., Philadelphia 43, Penna.

I am a member. Are you? W1ZPT.

SELL Milen 90800 500 watt final, like new, Milen 90600 exciter, 616-6146 exciter, low and high voltage power supplies, rack mount. Best offer over \$125 takes all. A. T. Lenny, 243 Bannock St., Malad City, Idaho.

FOR Sale: DX-20, key and crystals. Good condition, \$30. Wayne Lee, Rd #1, Marathon, N. Y.

SALE: B-4W 5100B 518-B generator, never used, \$500; SSB receiving adapter model 370, \$100; Match Master, \$35. Dennis F. O'Neill, 200 Oak Lane, Primus, Del. Co., Penna.

WANTED: Aircraft, Airline, Military, Electronics gear and test equipment. G. E. Blandford, ARB, 1000 N. Marco, BC348, BC61-0E, ARN6, ARN14, ART13, 51R3, MN62A, others. We pay C.o.d. advise price, condition. Riteo, Box 155, Annandale, Va., Phone Jefferson 2-5505.

HAVE been called by Army. Must sell SX-101 receiver (8 months old), \$325. Viking Pacific transmitter, \$425 (4 months old); Matchbox, \$35. All in perf. condx. Will ship on receipt of money order. F. H. Leslie, K8IKR, 3727 Belmont, Cincinnati 27, Ohio.

SELL HRO5 receiver, \$115; BC221 with book, \$55; audio signal generator, \$15; prop pitch motor, \$12.50; Vibroplex, \$5; three-speed record changer with GE A-7-D preamp, \$17; 8135, \$5; VHF antenna, \$10; Milen power supply, \$150; 1200 watt power supply, \$40; 300 watt Universal 811 modulator, \$40. Will answer all inquiries. W8GIB, Pierre Declave, 8438 Alma Ave., Castro Valley, Calif.

WANT 30-50 Mc. 152-173 Mc receiver. Hallicrafters S-81, S82, S-94, S-95. Policealarm or other "Civic Patrol" receiver. Trade Webcon tape recorded for Communicator or ??? Trade stereo types for ??? Write: Stewart-Warner Portafones, W9WFT, 2020 Bradley, Chicago 18, Ill.

SELL 32V3 transmitter, for sale, A-1 condx, \$485. Also selling KW rig, CW-NBFM, Sonar VFX680 exciter, driving 807, PP 813 final. All Thordarson power supply. Varac controlled, illuminated meters. Must be seen to be appreciated. Al Gruber, WINUZ, 164 Denfield Rd., Cranston, R. I.

BOB GRAHAM, W1KJ7 (Graham Company) has moved to new and larger quarters at 505 Main St., Reading, Mass. Telephone READING 2-4000. All work is carried on at the radio shop with the best new and used gear, including Conrad, National, Hammarlund, Hallicrafters, Johnson, Central Electronics, Astatic, C-D, etc. We buy-sell-rent-install-service ham eq'n'pment. See us for the best deal.

ELMAC 4-250-A, two, brand new, \$25 each. W1DDB, John Savonis, 11 Dwight Court, New Britain, Conn.

SWAP for latest model factory-wired Ranger, 3 1/2 x 4 1/2 Super D Grafei x Grafei, 6" Kodak Ektar, automatic diaphragm, Grafei gun, slit film holders, adapter, K2 filter, film developing tank, etc. all like new, latest features, in A-1 condx. Rev. J. Terstege, 114 W. Van Trees St., Washington, Ind.

YOU asked for it. A broad band I.F. coupler tuned to 455 Ke for double sideband reception. This unit will plug into the mechanical filter socket of a 75A-4. Only \$12.95 postage prepaid. Busacker's, 1216 West Clay, Houston, Texas.

ELMAC AF-67 for sale. Perfect. Like new. Never mounted. Perfect condx. Sacrifice. Only \$140. Mary, W4VJK, Box 48, Lewishburg, Tenn.

HQ-129X with matching speaker, \$125; Viking II (factory-wired), \$190, in A-1 condx. Dave Mueller, W8LBD, 10 Alcott Lane, Cincinnati, 16, Ohio. Phone Jackson 1-7534.

FOR Sale: Complete Elmac mobile rig, PMR-6A receiver, AF-67 transmitter new, 6146, square 12 V dynamotor, Vibrator power for receiver, 12 V dynamotor, filter condenser, 12V coils, tank relay. Webster all band antenna, 96" whip for 10 meters included, all 2 years old. Grade A shape: 6 volt Carter dynamotor free if bought in 10 days. Price \$300 shipped express east of Mississippi. W. L. Hamm, W3JOD/4, 5506 Pebble Lane, Norfolk 2, Va.

SELLING KW-1 — For sale. Finest Kilowatt available for AM, CW and SSB, with 10A or 20A exciter. Will arrange sale for \$90, 40 or 20 meters. \$2250. Also Morrow mobile twin, MB-560A, MBR-5, 12 V volt RVP-250 and dynamotor. RT8-6008 AC power supply, mike, all band Bassed coil and antenna: \$450. W8JUY, Bill Marthine, 221 Boardman Ave., Traverse City, Michigan.

FOR Sale: KW-1, 2 1/2 KW Collins modulation transformer, 500 watt modulation transformer with screen winding, several chokes, condensers and power transformers. Write for list. Bill, W8VPO, 10185 Rose Ave., Ontario, Calif. Tel. Y-2299.

FOR Sale: Coast Guard DAE-1, 240 to 2000 KC direction finder with loop assembly, original cost \$450 for \$40 and Navy RBL-4, 15 to 600 KC radio receiver (short bands) original cost, \$600 for \$25. Both sets unused in original waterproof overseas shipping cases. Sell as is F.o.b. Highland Park, Ill. William S. Loomis, 933 Central Avenue.

ORIGINAL home/cw transmitter described on page 68 of May QST. Sell, never used. W1CFE.

GLOBE KING 400 watts phone \$200. W2TCG.

WANTED: DX-100 and good receiver. HQ-100 or SX-100, etc. Prefer package deal. Unable to pay full amount in cash, but have good credit references. Would like short trial period. State condition, lowest price, and acceptable terms. All letters answered. L. W. Larabee, K6DTD, Box 33, Palm Springs, Calif.

SELLING Johnson 4-element 10 and 3-element 20 meter interlaced beam and 50 foot coax feed lines. Gamma match. Complete, \$125. F.o.b. Saskatoon. Victor Letol, VE5VL, Sub #1, Saskatoon, Sask., Canada.

MUST Sell: \$X-96 \$150. Edico TR75 bandswitching with VFO and AM 40 modulator, \$75. All in A-1 condition. Larry Gittings, 117-239th St., Elmont, N. Y.

HQ140X, speaker, 100 Ke. calibrator, all perfect. Shipped F.o.b. in original carton. First \$200. Bernie Ostrosky, W9HTF, 2012 Parkway Drive, Highland, Ind.

SELLING 32V3 transmitter, late model, outstanding condx, no modifications or scratches: will satisfy most discriminating customer: \$525 and two meter transmitter, \$29 final, excellent modulation, runs about 60 watts, all circuits metered and all components new. \$75. Sorry, cannot ship. W2JMH, Mahland, 23 Locust Ave., Eatontown, N. J. Tel. Eatontown 3-2166.

SELL: Custom-built kilowatt linear amplifier using new 4CX1000A. Send for details, also custom-built 4-400A kilowatt amplifier with 4X250B, ABI modulator. Rack mounted with power supplies. Send for details on this, too. W8HHW, Wolfe, 3476 Rainbow Dr., Palo Alto, Calif.

FOR Sale: New oil condenser 50 μ fd 3000 vdc, \$30; new Chicago plate xfrmr 4700v, 300 Ma., \$20; new UTC PA108 choke, 10 by 500 Ma., \$9; choke 9/6 by 400 Ma., \$5; tubes 837, \$1; 4/3E29, \$6 each. Want: 20A cabinets & NC-101X. Phone PG 7-2271, Charles Copp, W2ZBD, 3 West Drive, Port Washington, N. Y.

SWAP OR For Sale: Combination tube multimeter tester RCP-804 with adapter or tube tester. For RME DB-22A Preselector or short-wave receiver same value. Also Sams No. 1 to 201, in exc. condx. Best offer over \$125. Joseph Mila, 320 East 42nd St., New York 17, N. Y.

PROTECT Your QTH from fire with an automatic fire alarm. Placed near your rig it will be on guard day and night ready to sound its 1/2 mile howl if fire should occur. Only \$4.95. Aldon Electronics, Box 96, South Amboy, N. J.

SELLING KW-1 Deluxe AM-CW kilowatt transmitter, recently factory overhauled for SSB linear operation. Excellent condition, complete with many spares. \$2,650. Write W68AI, Bill Orr, 555 Creatine Dr., Los Angeles 49, Calif.

FOR Sale: Gonet II, new condition. Beam and 100 ft. coax included. \$150. J. E. Bright, W2BOW, 131 Nugent St., New Hyde Park, L. I., N. Y.

FOR Sale: New SX100, only a few hours use: \$300 value for \$200. George Badger, W6RXW, 416 Waverly, Menlo Park, Calif. Tel. DA-5845.

CANADIAN: Sell or trade — Marconi home/cw cool KW, PP304TH Class B mod. PP 8056, Hallicrafters 100 watts mod. H-4, Hammarlund HQ129XA receiver. All in A-1 condx. VE2ZOU, P.O. Box 355, Riviere du Loup, P. Q., Can.

CRYSTALS Almirall, Novice, General, Net, Mobile, FT-243. Any wavelength 4000 to 10,000 Mc. \$1-200. Trans. FT-243, \$1.45. 1700 to 3490, \$1.75. 860 to 21,500 overcome 0.1%, \$1.95. Write for Marine brochure and other crystal frequencies. Crystals since 1933. C-W Crystals, Box 2065Q, El Monte, Calif.

553A in A-1 condition, \$65. W1HBI, Darien, Conn.

FOR Sale: Collins 75A-4 and speaker. Like new with 3.1 Ke filter used only a few hours, \$580. 20A exciter like new, \$175. Must sell to pay for new airplane. Will deliver between New York and Norfolk. James Gammill, Box 253, Patuxent River, Md.

SALE: Homebrew double-conversion receiver 1750 and 100 Keilis-like HBR-14 (QST July 1957) but tunes 3.5-4.0 and 7.0-7.5 Mc without coil change; in cabinet, Millen 10035 dial, 15 and 20-meter crystal converters included, \$125. Also DX-40, new, \$60. J. T. Morey, W2HXR, 210 Mountain Ave., Princeton, N. J.

SELLING complete station, HQ-129X, \$135; DX-35, \$50; Heath FPO-1, \$17.50; UTC-80, \$15; Heath 1000, \$7; Johnson, \$195. Also Heath AT8 amplifier, \$15; Heath tube checker, \$24. All in gud condx. Need cash for college. Mohn, K2RPI, 8201 N. W. 32nd Ave., Westwood, N. J.

GOING into Navy. Selling station: RME 4300 with Heath Q multiplier and speaker, in new A-1 condx. \$185; RME 4301 SSB silder, new in February, \$65; 20-A exciter with BC-458, 160-15. VFO, both new at Xmas time, now in A-1 condx. \$230; WRL linear power, LA-1000, new in February, and in exc. condx. \$100. Write for full info on price of equipment. A. S. Jones, K4JEE, 8201 N. W. 32nd Ave., Miami 17, Fla.

FOR Sale: Superior TV-50 Gen-Q-Motor, not used, \$35; Century pix tube Rejuva-check, \$3.50; Wanted: Harvey-Weis Z match, 300 Q 80-40-20 ant. kit, Viking Ranger, tape recorder, AM-FM tuner, Lafayette SY-93, speaker system enclosure. Harold Cushing, W1EUS, 16 Preston Dr., Manchester, Conn.

RCA 30-50 Mc. 30 watt output FM mobile transmitters with 6v dynamotor, \$12.95. Less dynamotor, \$7.95. Easily converted to AM or useable as is NFM. Teinobile, Inc., 60 Grant Ave., Bethpage, N. Y. All orders F.o.b. New York

FOR Sale: Pair of bands new 4-250A, \$30 each. Two pair used \$40. \$15 each. W8VPO, \$15-5 600 watt MultiMatch modulation transformer, B4W, HDA-15, 1000 watts, 100 ft. center link 10 through 80 meters, \$1.25; each; four new 3047LS, \$9.00 each. Six new 100TH, \$5 each. WITTYQ, RFD 5, Danbury, Conn.

GONSET 10-11, \$15; Gonet Clipper, \$5; Master Mobile whip, #132 mount, coll. \$12; Gardner automatic code-sender with 10 practice tapes, \$15; Bud code practice one, CPO-128A, \$10; Suburban Sentinel transmitter 120 watts phone, all bands, \$175; Messner Signal Shifter model 9-1090, \$40. W1S1K, Ed Wattman, 125 Eleventh St., Providence, R. I.

SELL: W1EUS 32V2 with NFM unit and spare 4D23, in gud condx. Cash and carry, \$285. John Drougas, W2AGL, 16 Glenmary Ave., Red Bank, N. J.

SELL: HE10000 spkr. A.B.C.D and AC coils: \$350; Viking II factory-wired, Johnson FPO, v.t. keying, in-base filter, ant. rel., \$245. 15 and 20 meter, 3-6, Electro-Fab beams, CD rotator, 40' crank-up tower. Sorry, no shipping. All in exc. condx. Virgil Owen, 4032 W. Ave. 40, Los Angeles, Calif.

FOR Sale: DX-20 \$30 K1NDIW, 38 Thornton, Revere, Mass. Locals only!

SELLING 32V1 with factory modifications to include best features of the 32V-2 and 32V-3. TVI suppressed. Recalibrated at Collins plant in February 1958. \$295. HQ-129X revr, \$125. Robert Olson, W8MTR, 1069 27th St. N.E., Cedar Rapids, Iowa.

MORILEERS! Will trade for fixed station receiver or transmitter of equal value, a 49 Oldsm, in top condx and the following gear for above car: 80 amp. alternator, Gonet G66 revr, TBS-50D and PDE-103. Will deliver within 300 mile area. W1Z2W.

TUBES: Brand New Elmac 4-250A's \$25.00, 4-125A's \$15.00, 4-107A's \$10.00, 4-72A's \$8.00, 802B \$10.00, 302B \$6.00, 303 \$2.00, 810 \$6.00, 812 \$6.00, 815 \$1.75, 820B \$6.00, 832A \$6.00, 835 \$2.00, 838 \$1.00, 866A \$1.50, 872A \$2.00, 2E26 \$2.25, 250h \$17.50, 211 \$2.00, 8003 \$3.50, HX25 \$2.00, HK54 \$6.00, 615.6's \$1.50, Plate transformers, new, 115V/2300VCT-500MA \$25.00, 115V/2300VCT-250MA \$25.00, 115V/1850VCT-500MA \$18.00, 115V/750VCT-689MA \$18.00, Collins Chokes 4HY-300MA \$5.00, 412-1000 \$4.00, 412-1000A, Sams Generator 412-1000 \$1.50, 31MC \$3.00, ART-13 Modulator Transformer \$8.50, all guaranteed, C.O.D. or K.O.K. Bill Slep W4PHY, Box 178, Elenton, Florida.

WANTED: All types communications receiver, transmitters, test equipment. Teletype especially 75A, 32V, 51J, BC-342, BC-610, BC-221, URA-8, etc. Cash or trade for NEW: Ranger, Valiant, Thunderbolt, HT-32, HQ-160, Gonet, Fisher HI-FL, Bell, etc. Write Tom, W1AFN, Altronics-Howard Co., Box 19, Boston, 1, Mass. (Richmond 2-0048) Stores: 278 Friend St. Boston (near North Station) 60 Spring St. Newport, R. I.

FOR Sale: Johnson Adventurer, Edico 40-watt modulator, Heathkit VFO, All for \$70. W8JJA, 1704 Avenue L, Brownwood, Texas.

VAN SICKLE gives one radio directional finder free with purchase of 3 National NC-66, \$120. Limited quantity. W9KJY, 4131 N. Keystone Ave., Indianapolis, Ind.

SELL: Plate transformer SMC Electric Prod. Corp., Model ST-125. 2600 watts each side c.t. at 400 Ma., CCS 110, vol. primary. Weighs an even 80 lbs. \$30 F.o.b. Hartford, W1IKE, % ARB1. HQ.

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Application



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Designed for Application. A complete line of both metal and plastic cathode ray tube bezels, including plain, illuminated reticule, and camera mount styles, for use with all types of tubes (regular, flat face, square, etc.) and our complete line of stock and custom built Mu-Metal and Nicoloi shields.

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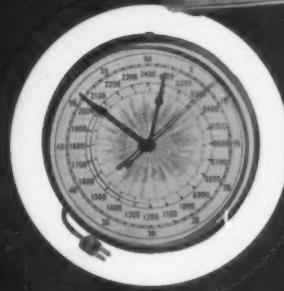
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